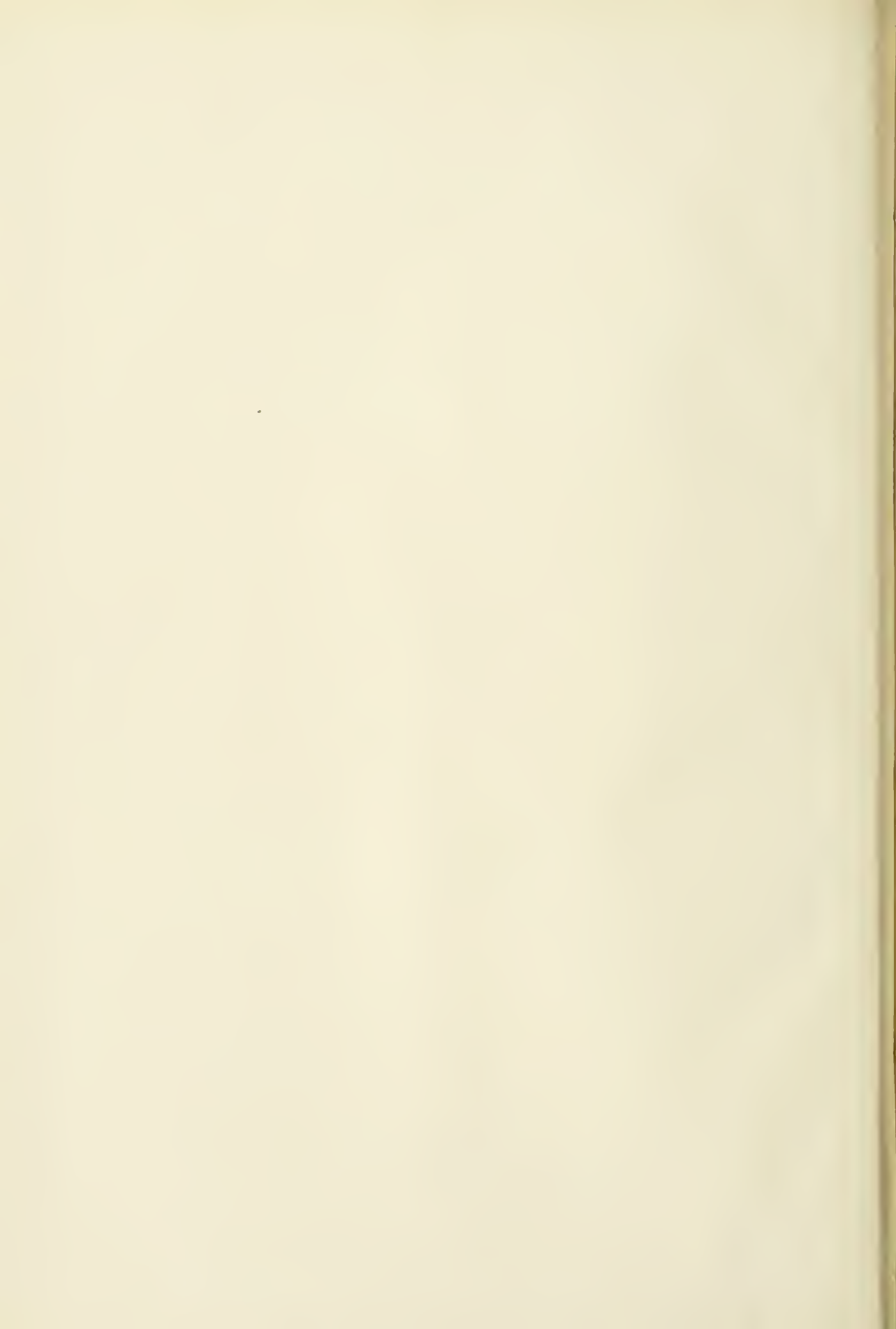


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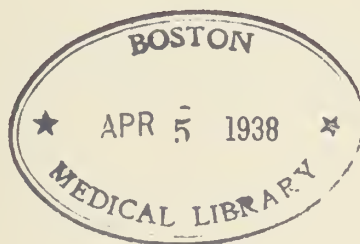
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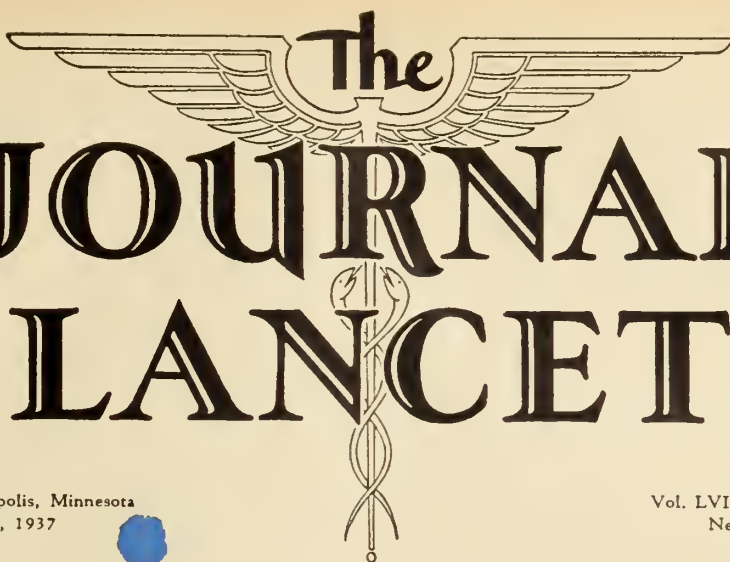
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High Gastric Resection in Cancer of the Stomach With Relation of Personal Experiences*

by

Owen H. Wangenstein, M.D.**

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MORE than fifty years ago, Billroth did the first successful gastric resection for cancer of the stomach (1881). In 1890, before the German Surgical Society, he reported that 24 such resections had been done in his clinic. He ventured the prediction that with improvement in operative technique and earlier recognition, results would be better. A few years later, X-ray examination came into being. With the development of the opaque meal by Rieder, and studies of gastro-intestinal motility by Cannon, earlier recognition of cancer of the stomach through the agency of X-rays, became practical.

In 1914, Friedenwald, of Baltimore, reviewed the records of 1,000 cases with cancer of the stomach. In the group, only nine had been found resectable, and not one had been saved by operation, Friedenwald said. In 1922, Cheever reported 236 cases that had been observed at the Peter Bent Brigham Hospital in the ten-year period intervening since the opening of the hospital. Half of the cases had demonstrable metastases when they were first seen. Of the patients explored, half were found to be non-resectable. Of the resected cases, 13 per cent survived more than five years. Since these and other rather discouraging reports relative to cancer of the stomach have become more widely known, there have been expressions here and there, particularly amongst internists, that cancer of the stomach is beyond remedy, and that patients so afflicted should be left to their own fate—it being, of course, well-understood that the mortality of cases so managed would be 100 per cent. Anyone not convinced of the value of surgery in the treat-

ment of cancer of the stomach and desirous of having his faith strengthened, may, I believe, be readily converted to such an attitude by the perusal of the surgical literature of the last decade.^{1, 6}

The Diagnosis

Before discussing the surgical problem presented by the patient with the high lesion, I wish briefly to mention a few items which bear intimately upon the problem of cancer of the stomach. In its recognition, if we as physicians will always *demand* a diagnosis of a dyspepsia rather than immediate relief by therapy, the instances in which the diagnosis is made too late will be considerably fewer. A patient who has a complaint referable to the gastrointestinal canal should receive an investigation including a barium study, and not powders for the symptomatic control of the disorder. Whereas in the hands of the expert, barium studies of the stomach may be 95 per cent correct as to the presence or absence of a lesion, in the hands of the novice, the method may be equally as inaccurate. In order to secure most for our patients, such examinations should be concentrated in the hands of persons who have had special training and experience in fluoroscopy of the stomach and interpretation of films. The roentgenologist is essentially a diagnostician who encompasses the entire field of medicine, but who has become master of one diagnostic agent.

A recent experience has taught me that gastroscopy may be an important agent in the early recognition of gastric malignancy. Drs. George Fahr and Arthur Kerkhof recently referred a patient for operation in which X-ray films and fluoroscopy failed to demonstrate any

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**From the Department of Surgery, University of Minnesota.

defect in the gastric wall. Dr. Kerkhof on gastroscopy had observed a lesion which he interpreted to be a carcinoma at the greater curvature at the points of junction of the middle and upper thirds of the stomach. Roentgen restudy at the University Hospital failed to demonstrate a gastric defect. At operation an indurated area was found, extending over a three-inch length, at the site described by Dr. Kerkhof. It was my impression that the lesion was either linitis plastica or a scirrhus carcinoma. Resection was easily done and the patient made a satisfactory convalescence. Microscopic study demonstrated the lesion to be scirrhus carcinoma. To be certain, the lesion was at an unusual location, where recognition by the employment of the roentgen rays was difficult; but how many months more would such a lesion have to be present before it could be demonstrated on an X-ray film? A small lesion may be observed through a cystoscope which obviously cannot be seen in a cystogram. This analogy, to be sure, cannot be carried over to the stomach; yet, in this contrast is indicated the superiority of direct vision in the determination of the nature of early lesions.

Is the Lesion Ulcer or Cancer?

Not infrequently, with the opinion of the roentgenologist in hand, the clinician is unable to decide definitely whether the lesion is ulcer or cancer. In many such instances, the ultimate determination of the exact nature of the lesion must be left to the operating surgeon or the microscopist. How long symptoms have been present is not a significant determining factor. I have come to feel that there is as assuredly *acute and chronic cancer* as there is acute and chronic infection. The pathologist would speak of this difference, in terms of disparities of rate of growth. Some of the best end-results that have come to my attention in cancer of the stomach have been observed in those instances, where despite a rather long story, the patient still presents a resectable lesion. The patient with cancer of the stomach who presents himself with a large palpable mass, with a story of three months' duration, has less promise than the man who comes after two years of trouble, but whose lesion is still within bounds. Not for a moment do I want to lend the impression of condoning delay in the recognition of cancer of the stomach, but I do wish to emphasize that the earliness with which the patient presents himself is not the *sole* influencing factor in the prognosis. The initial grade of malignancy, that is, is it a rapid or slow growing cancer, is equally as important.

When the patient has had symptoms for several years, if the X-ray findings are not decisive, and particularly if the symptoms are relieved by medical management (non-irritating foods and alkaline powders), common practice is to conclude that the patient has an ulcer and that such apparently satisfactory treatment should be continued. A limited trial with supervised medical management (three weeks), as L. G. Cole, of New York, has advised in such instances, is certainly in order; but if roentgen examination fails to indicate definite heal-

ing of the lesion, operation is to be advised. In the series of cases herewith reported, there is one whose lesion proved to be a sarcoma when excised. His dyspepsia had been of several years' duration and he was completely relieved of his symptoms by medical management under hospital supervision. Only the persistent protest of the roentgenologist saved further delay in ascertaining the nature of the lesion.

Now, a statement which we have long been accustomed to hear, and a suggestion which seems quite credible, is that cancer of the stomach with long histories develops from benign ulcers. Such an occurrence has adequate precedence in the known development of cancers upon chronic ulcers in the skin. However, satisfactory proof must be offered to indicate that a similar sequence of events occurs frequently in the stomach. The best evidence for such an occurrence appears to be: (1) those instances in which cancer can be demonstrated histologically in a small segment of an ulcer, and (2) those cancers in which the muscle of the gastric wall over the extent of the cancerous ulcer is missing. Cancer invades muscle and rarely destroys it, as does a benign ulcer of the stomach. Judged in the light of such criteria, ulcer, it appears, precedes cancer in about 3 to 5 per cent of instances.

Papillomas undoubtedly are frequent precursors of cancer in the stomach, as well as in the colon. At the University Hospital, this transition from papilloma into cancer, in patients who have refused operation for the removal of a gastric polyp, has been observed.

The Resection Group

At the University Hospital during the last 30 months (from July 1, 1933, to January 1, 1936), 109 cases of cancer of the stomach were seen. Forty-four were inoperable on admission because of distant metastases or a general condition which would not permit of operation. Of these 44 cases, 12, or 27 per cent, were terminal on admission, and died in the hospital. Resection was done in 31 instances, of which number, 13 were done by me. There was one death among the 13 cases, or a mortality of 7.6 per cent. One of the 13 was carried on the records as a case of cancer for more than a year, but recent restudy shows it to be a benign ulcer.

All but two of these cases presented extensive lesions, necessitating subtotal resection. In three instances, including the case which died, resection was done without clamps, because of the small residual gastric pouch left. In six of the group, adherence of the tumor to the pancreas or mesentery was present. In no instance, however, was it necessary to resect the transverse colon as well. In two instances, because of enormous weight loss incident to high-grade obstruction, a two-stage operation was done—a high anterior anastomosis being made to the fundus of the stomach at the first operation with an enteroanastomosis between the afferent and efferent loops. In lesions with some fixation, it is invariably easier to make a high anterior anastomosis than a posterior one. One of these patients gained 20 pounds in weight in a month's time before the second operation. One of

the patients in the group with an unusually large polypoid adenocarcinoma of the stomach had an initial hemoglobin of 11 per cent. After several preliminary transfusions, operation was withstood without event despite adherence of the growth to the mesentery and transverse mesocolon.

A number of these operations undoubtedly must be looked upon as being incomplete in nature. Yet, the palliation afforded is much worth-while. We have no patients who have survived gastroenterostomy as long as two years when the cancer was not removed. Occasionally, a patient will survive gastroenterostomy for an obstructing cancer of the pylorus for as long as a year. The removal of the lesion stops hemorrhage and usually improves the nutrition and general status of the patient. The anxiety to extend such palliation to patients whose general condition is poor or to patients whose lesion is fixed over a wide extent can only be purchased at the cost of a higher operative mortality. The surgeon must strive to keep the mortality of the operation within reasonable limits; at the same time he must not deny patients, whose general status is reasonably satisfactory, the opportunity for palliation which a successful operation affords. In the main, our policy at the University Hospital has been to operate upon all patients with cancer of the stomach where the following conditions are met: (1) the general condition warrants operation, (2) there are no distant metastases, (3) ascites is not present, and (4) from the roentgen standpoint the lesion is operable—this means that the lesion does not extend to the cardiac aperture.

In instances which are doubtfully operable, judged in the light of the proximal extent of the lesion as observed in the roentgenogram, I have come to insist on a film made in the erect posture. In this position, one can gain the best impression as to whether normal stomach intervenes between the lesion and the cardiac orifice. As one reviews critically every case with the above considerations in mind, the operations which will be limited to exploration will be few in number. The matter of advanced age always pyramids the risk. This factor, I believe, should be correlated with the patient's general physical condition. The oldest patient for whom I have done a successful resection was 81, and strangely enough, it turned out to be a benign ulcer! The oldest patient for whom I have done resection for cancer of the stomach was 79. He lived long enough to need endoscopic prostatic resection and finally succumbed to an intra-oral malignancy.

Technical Considerations

Apart from the generally poorer physical status of patients with cancer of the stomach as operative risks, as contrasted with that of patients with benign ulcer, an equally important consideration is the microbic character of the stomach and upper reaches of the intestine in gastric cancer. Owing to the absence of free hydrochloric acid, the presence of a rich bacterial flora in the fasting stomach is usual; in the normal stomach, on the contrary, as well as in the stomach, the seat of ulcer,

the presence of free hydrochloric acid keeps the fasting stomach free from bacteria. This occurrence is of major importance in the operation for removal of the cancerous stomach—as it is, too, in operations upon the lower reaches of the intestinal canal which have a bacterial flora in the presence of a normal stomach. Over a period of several years now, I have had one-tenth normal hydrochloric acid instilled frequently into the stomach, through an inlying duodenal tube, for several hours before operation—a total of 90 to 120 cc. being put into the stomach in this manner over a three or four hour interval before operation. That this procedure reduces the bacterial counts in the fasting empty cancerous stomach my associate, Dr. Rea, and I have been able to show.

Similarly, at operation, greater care in the avoidance of soiling is necessary in making the anastomosis. I have the impression that, on the whole, surgeons have not availed themselves enough of the employment of local antiseptic measures at the time of operation upon the alimentary canal. Experience with the establishment of enteroanastomoses in patients with cancer of the colon, in the presence of some obstruction, where feces may be found accumulated in the bowel, proximal to the obstruction, despite elaborate efforts at preliminary pre-operative cleansing of the colon, have taught me the value of local antiseptic measures at operation. If the colon is carefully opened, the content removed without the slightest soiling and the mucosal surfaces of the bowel are lightly sponged with soap solution (sodium ricinoleate 1 per cent) until they glisten, the hazards of anastomoses under such circumstances are reduced to a minimum. In operations upon the cancerous stomach, similar precautions are rewarded by a considerably reduced risk of peritoneal infection.

After a trial of various anesthetic agents, I have come to feel that ethylene followed by whatever amount of ether is necessary, is the safest anesthesia; even in patients in advanced years. The best approach is afforded through a high left rectus incision. The patient is sent to the operating room with the duodenal tube in place. During the course of the operation, suction is continually in force; the tube is pulled up into the residual gastric pouch as the resection proceeds. During the postoperative convalescence, suction is continued until intermittent clamping of the tube occasions no distress. The patient is allowed water by mouth when awake and the tube can usually be withdrawn after about four days.

I have usually made the posterior Polya anastomosis. When the stoma in a high resection cannot be brought below the transverse mesocolon, an enteroanastomosis is also made. The anterior anastomosis of Balfour has the advantage that a recurrent lesion is more readily operated upon after the anterior operation. Only once, however, have I felt justified in reoperating for recurrence after resection for cancer of the stomach. The patient did not survive the second resection. Recently, Dr. Manson of our clinic did make a successful re-resection of a stomach for recurrent cancer.

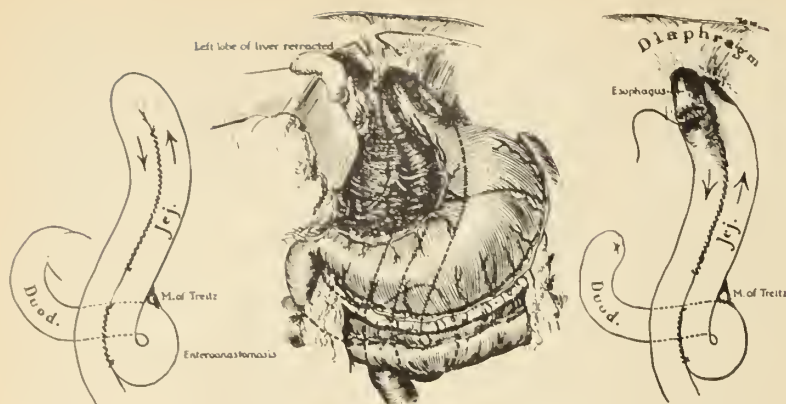


Figure 1. A suggested technique for total gastrectomy—the operation to be done in two stages. At the first operation the adjacent limbs of a jejunal loop are drawn through the transverse mesocolon and behind the stomach and are sutured to the diaphragm and the mobilized subdiaphragmatic esophagus. An entero-anastomosis is made between the two limbs of the jejunal limb near the root of the mesentery. The continuity of the gastro-intestinal canal is not disturbed.

At the second operation, the stomach is removed and the esophago-jejunal anastomosis is completed.

Total Gastrectomy

The impression has been lent above that only resectable cancers are operable. In the main, this statement still holds true, for whereas there have been now a fairly large number of successful total gastrectomies for cancer reported, the mortality has been great.^{5,9} I was fortunate enough to have the first patient survive upon whom I attempted total gastrectomy. In consequence, I was led to try the procedure on several additional patients, all of whom died in the hospital. This unhappy experience has discouraged me considerably. I still believe, however, that an adequate technique can and will be worked out. The anastomosis can be satisfactorily made in suitable cases without too great difficulty. The chief difficulties are concerned with: (1) the microbic character of the esophagus and the cancerous stomach, (2) the tendency for the esophagus to retract into the mediastinum. I have just recently again, for the first time in a long time, attempted another total gastrectomy. It was done after the plan shown on the accompanying diagram. At the first stage, the esophagus was mobilized and pulled down after the avascular ligament of the left lobe of the liver had been cut, permitting of retraction of the liver out of the way, well to the right. A loop of small intestine was brought through the transverse mesocolon and sutured to the esophagus and the diaphragm. This procedure was facilitated by openings in the gastro-hepatic and gastro-colic omenta. The blood supply of the stomach was not interfered with. The adjacent edges of the afferent and efferent limbs of the jejunal loop were approximated by a running stitch of fine catgut, and an enteroanastomosis was made between the two limbs just beneath the transverse mesocolon.

This operation was well-tolerated. After two weeks, the second stage was attempted, but an abscess was encountered in the abdominal wall. A month after the first operation, the peritoneal cavity was opened. Unusually extensive adhesions were found throughout the upper abdomen, making re-entry extremely difficult. Total excision was done, but the technical difficulties were great and the patient succumbed from his operation. Nevertheless, I have the impression that an operative procedure after the plan here suggested, done in one or two stages, which will obviate retraction of the

esophagus and avoid contamination, will prove feasible.

In the patient upon whom I did a successful gastric resection, the extraordinary observation was made that the patient's hunger sensations after gastrectomy were in every way like those before excision of the stomach.¹⁰ This observation would suggest that hunger, like thirst, probably originates in the tissues themselves.

Conclusion

Gastric cancer will be earlier identified, when diagnosis rather than symptomatic relief is demanded in patients with dyspepsia. A long history does not of itself exclude malignancy and some of the best results are obtained after resection in this group. *Chronic and acute cancer* are as definite entities as acute and chronic infection. The matter of a benign ulcer being confused with cancer is of far more importance than the question of the number of benign ulcers which may become malignant. A more frequent precursor of gastric cancer than ulcer is a gastric papilloma.

Of patients coming for operation with gastric malignancy, a large number are inoperable. In the operable group, however, a large number of lives are to be salvaged by resection, with a reasonable operative mortality. The risk of total gastrectomy is still prohibitive, but elaboration of an adequate and suitable technique will justify its more frequent performance for the relief of gastric malignancy.

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Subphrenic Abscess*

by

Arthur J. Movius, M.D., F.A.C.S.

Billings, Montana

THE TITLE of this paper should be subphrenic abscess, with special emphasis upon the right posterior superior subphrenic space, and the extra-peritoneal operation.

The subject of subphrenic abscess has been one of more than usual interest to us for a number of years. The importance of this condition is apparently not appreciated by many medical men. Perhaps the most serious complication that can follow a case that survives an attack of peritonitis from any cause is subphrenic abscess. It stands in the minds of numbers of medical men as an almost hopeless situation, inasmuch as the reports of many surgeons in the past showed a mortality ranging from 33 to 50 per cent or more in the operated series. When we consider that a majority of subphrenic infections are the result of an intra-abdominal contamination, caused usually by the spread of micro-organisms from an inflamed or ruptured abdominal organ, and that this is happening over-and-over every day, it is clear we should give this complication greater study. Medical literature these later years has been enriched by numerous observers. As a result, infections of the subphrenic spaces are now being considered a possible complication in all septic intra-peritoneal processes, and cases of insidious onset and long-continued fever in which diagnosis has been in doubt. It would seem, therefore, that every physician who handles cases of appendicitis, and that means all of us, should become subphrenic-minded. This paper is presented for that very purpose; that earlier diagnoses may be made and proper treatment instituted before the fighting powers of the patient are too seriously lowered. The incidence of subphrenic abscess is given by some observers in one to six per cent of all appendicitis cases. If this be true, how much higher it must be in those cases that have gone on to rupture and general peritonitis!

Our study is based on a review of the current literature and an experience with 20 proved and suspected cases of subphrenic inflammation. Fortunately, not all subphrenic infections go on to suppuration. Ochsner states that he believes only 30 per cent go on to abscess formation.

The history of subphrenic abscess is interesting. Barton described it in 1845. The first recorded operation for drainage of such an abscess was performed by Volkman in 1870. Heyden in 1886 again described the clinical picture. The symptoms depicted by those pioneers is very commonly accepted as typical today; that is, the liver dullness is surmounted by a tympanitic area. Above this area is a dullness due to a pleural exudate. A gas bubble on top of the abscess in the

upright position accounts for the tympanitic zone. Such findings often represent a late stage of the condition. If these signs are waited for, many cases will be overlooked or valuable time lost in the treatment of the patient.

It has been estimated that 90 per cent of the subphrenic abscesses follow infections within the abdomen. Appendicitis, gastroduodenal lesions, and infections of the liver and bile passages are by far the most frequent causes. The appendix is said to be the most common offender. Fifield and Love found this to be true in 35 per cent of their cases, and Ochsner and Graves in 31 per cent of their series. Perforations of the stomach and duodenum are next in frequency; 28 per cent in the Fifield and Love series, and 29 per cent in the Ochsner and Graves series. Lesions of the gallbladder and bile passages were causative agents in ten per cent of their cases. Other causes are cancer of the stomach and intestines, operations on the stomach and intestines, pelvic disorders, trauma, abscesses of the liver and kidney, *etc.* The bacteria responsible for the infection vary according to the original process. Most frequently obtained were *B. coli*, streptococci, and staphylococci, the first two predominating.

The anatomy of the subphrenic space was worked out by two Frenchmen, Martinet in 1845, and Piquard in 1910. It is commonly agreed that the space between the diaphragm above and the colon and mesocolon below is the subphrenic space, and any localized abscess in any part of this region is a subphrenic abscess. This space is divided into several spaces by the presence of the liver and various ligaments. The liver divides it into superior and inferior spaces. The reflexion of the peritoneum from the diaphragm to the liver, the suspensory ligament, divides the superior space into right and left superior spaces. The right superior space is further divided into anterior and posterior spaces by the coronary ligament, the right prolongation of the suspensory ligament. On the left there is only one superior space as the left prolongation of the suspensory ligament runs along the posterior edge of the liver. On the under surface of the liver there are three spaces, one on the right and two on the left. The one on the right is under the right lobe of the liver, often called the renal pouch. On the left are two spaces, anterior and posterior, divided from each other by the gastro-hepatic omentum, the anterior being in front of the stomach and the left in the lesser peritoneal cavity. Then there are the retro-peritoneal spaces, the posterior one being of very marked clinical significance, located in the cellular tissues back of the liver on the right side.

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The right posterior superior space is the most important of the spaces. To repeat: it lies between the diaphragm and that part of the right lobe of the liver which is behind and below the right lateral ligament. Its lower border opens into the space below the liver and communicates with the external paracolic sulcus. Along this groove intraperitoneal inflammatory exudate may spread from the cecum and appendix or even from the pelvis. By its junction with the renal pouch this posterior-superior space may become infected also from the duodenal area, pylorus, or from the gallbladder. It is the space most frequently involved in abscess formation and consequently the most important for our consideration. Fifield and Love found this space involved in 38 per cent of their cases while Ochsner in a more recent series found 60 per cent of all his subphrenic abscesses in this space. Fifty to 80 per cent of those abscesses followed a ruptured appendix.

The space under the right lobe of the liver corresponds to the right renal pouch; below it is the hepatic flexure of the colon. The sources of infection of this right inferior space are numerous. Perforations of the pylorus or duodenum, and infections of the gallbladder or bile ducts may involve the space by rupture or direct spread into it. Suppuration may spread to it from the right iliac fossa or from the right posterior superior space. Yet this space is not commonly infected to such an extent as to go on to suppuration. Ochsner and Graves, for instance, collected evidence to show that this space was involved less than one-third as frequently as the first mentioned, the right posterior superior space. They suggested that perhaps adhesions form and obliterate the space before an abscess can form.

The left superior space between the left lobe of the liver and diaphragm is rarely the seat of abscess formation. The left anterior inferior space beneath the left lobe of the liver and in front of the gastrohepatic omentum is a common site of subphrenic abscess. The usual cause of infection is a perforated ulcer of the front wall of the stomach.

The lesser peritoneal cavity lies posterior to the gastrohepatic omentum. In the presence of infection the foramen of Winslow is very soon obliterated by adhesions; then the sac becomes isolated from the rest of the peritoneal cavity. The most likely cause of an abscess in this space would be a perforation on the back wall of the stomach, and pancreatitis. It may also be infected by leakage from a retrocolic gastrointestinal anastomosis or by perforation of a gastrojejunal ulcer.

Avenues of Infection

Infection may gain entrance to the subphrenic space in a number of different ways; first, by direct extension by way of the peritoneal cavity along the paracolic groove to the right kidney pouch. This is probably the most frequent cause. In the horizontal

position, the diaphragm and the pelvis are the lowest points in the abdominal cavity. Secondly, through the lymphatics, either the peritoneal or retroperitoneal. Extension is sometimes very rapid by this portal of entry. In experimental animals it has been found that graphite placed in the ileocecal area can be recovered four hours later in the lymphatics under the diaphragm. Thirdly, the infection may travel by the portal system producing a pyelophlebitis with the formation of a liver abscess which ruptures into one of the subphrenic spaces.

The symptoms of subphrenic infection depend upon the space invaded. Primarily there is a continued septic temperature day after day, elevated pulse, high leukocyte count and prostration. If a patient who has had an antecedent suppurative intraperitoneal process fails to improve as he normally should, and in whom no other focus can be demonstrated to account for the septic manifestations, one must consider subphrenic infection until proven otherwise. There may or may not be localizing signs. Occasionally there will be a sense of pressure in the upper abdomen or loin, and difficulty in breathing, especially on deep inspiration. There is often tenderness and rigidity over the invaded space. In those individuals with an infection of the right superior posterior space, the first one described, the pain when present may be referred to the right lumbar region or right shoulder. Often the symptoms are those of a pleurisy. If the right superior anterior and inferior spaces are invaded, there is tenderness along the right costal margin. Limitation of respiratory movements on the affected side occurs early. The diaphragm is often elevated and its excursion diminished. Of greatest diagnostic importance is persistent localized tenderness over the infected space.

If the abscess is in the right posterior superior space, the space most frequently infected, there is definite localized tenderness over the tip of the twelfth rib. This may be the only diagnostic sign present. The tenderness is localized along the costal margin on their respective sides in infections of the other spaces. If tenderness persists together with constant systemic symptoms of unabating infection, one is justified in diagnosing a subphrenic infection of the particular space involved. If one bears in mind the possibility of an abscess forming in one of these spaces, he will choose to give his patient the benefit of the doubt and operate, inasmuch as the mortality without operation is nearly 100 per cent. On the whole, the symptoms are vague, suggesting pus and infection in the gallbladder area, if on the right side. If, added to this, the patient continues to run a septic temperature, perhaps chills, hiccough, pain referred to the shoulder, unproductive cough, and a persistent subcostal or lumbar tenderness, one may be fairly sure he is dealing with a subphrenic abscess.

Diagnosis

If one bears in mind the history of the case, continued septic manifestations, and is subphrenic-con-

scious, many more diagnoses of subphrenic abscess will be made and many more lives saved. On the other hand, reports indicate that the diagnosis is often overlooked.

Touroff, in a recent number of *Surgery, Gynecology and Obstetrics*, writing on "Unrecognized Post-operative Infection" makes the following contribution to our study: "The author became interested in the subject as the result of an experience in which a death which appeared undoubtedly to be due to 'livershock' was found at subsequent postmortem examination to have been caused by unrecognized extensive subphrenic suppuration. Not only was the latter not detected during life, but its presence was not even suspected." He goes on to say: "In this connection the following quotation from Stanton is significant:

"Subdiaphragmatic abscess is very rarely diagnosed clinically. On the other hand, it appears to be found rather frequently at autopsy. I believe it is a more frequent complication of gallbladder operations than the figures would indicate."

Dr. J. H. Bridenbaugh, radiologist and my associate for many years, states that the X-ray findings in subphrenic abscess are very helpful at times, and often clinch the diagnosis. Elevation and fixation of the diaphragm usually occurs. This may be present in pneumonia and pleurisy as well. Often the X-ray study will show a cloudiness through the right lower lobe, suggesting a pneumonia. Sometimes there will be an associated pleuritis with effusion or an empyema. Ochsner states that the first two cases of subphrenic abscess he saw, he treated for several weeks for pleurisy with effusion without results. Bridenbaugh further states that X-ray plates of the chest should be made laterally as well as antero-posteriorly. In about 25 per cent of the cases an air bubble will show above the abscess, a straight line indicating the fluid level. This is a pathognomonic finding. The lateral view will determine whether the abscess is in the anterior or posterior space or both. Sometimes a second abscess will be located in the right anterior inferior space. Radiograms should be taken in the upright position and the antero-posterior and lateral views taken on full inspiration and expiration. Limitation of movement of one-half of the diaphragm will be the first abnormality noted. This suggests an inflamed lesion, but not necessarily an abscess. However, elevation of the affected half of the diaphragm is quite indicative of abscess formation, but not always so. Kokumis states this is shown in 90 per cent of the cases. Obliteration of the costophrenic angle is a common sign.

The infection of a subphrenic space may be of two or three different types. The first type is composed of cases which come with sudden abrupt onset with signs simulating acute intra-abdominal suppuration. These are usually cases in which the causative agent, such as perforative peptic ulcer, perforating appendicitis, etc., bring about contamination of the peritoneal cavity. Whether operation for the same is undertaken or not,

manifestations often continue and the patient does not improve as normally. The second type are cases with an insidious onset following an obscure intra-abdominal lesion. This type is frequently not suspected and not diagnosed. I shall here report briefly a case of each kind.

Our first case correctly-diagnosed as an abscess in the right posterior superior space was a boy, seven years old. Dr. Ochsner states that this is the youngest case on record. He came in with a history of a two-day illness—of nausea, vomiting and general abdominal pain. The leukocytosis was 18,000. The temperature was 104 degrees and the pulse 140. The abdomen was rigid. A diagnosis of general peritonitis due to appendicitis was made. Immediate operation disclosed an abdomen full of purulent fluid. The appendix was not located. Drainage of the abdomen was instituted. The patient rallied under the free administration of fluids and sedatives. After a week he began to develop more temperature again. This continued to be of the septic type for two weeks. A retrocecal abscess was suspected on account of tenderness over that area. This was drained, but the patient did not improve. Inasmuch as the abdomen was in good condition, a subphrenic abscess was suspected. The physical signs denoted tympany above the liver. X-ray examination by Dr. Bridenbaugh showed gas under the diaphragm permitting a tentative diagnosis of a subphrenic abscess in the right posterior superior space. The abscess was drained retro-peritoneally, according to the method to be described. This resulted in the patient's speedy recovery. He left the hospital in ten days.

The next case is typical of the second type with insidious onset. Male, 56, had chronic stomach trouble and was a tabetic. He developed an obscure abdominal pain for which no explanation seemed plausible. The temperature was 99 degrees to 101.6 degrees for a week, and the blood count 25,000. The abdomen was soft everywhere. Deep pressure gave some tenderness in the right upper quadrant. Some râles and dullness developed in the right lower chest. A diagnosis of pneumonia was considered; but the symptoms did not clear up. Aspiration of chest revealed clear fluid. There was decided improvement for two and one-half weeks. The temperature then assumed a septic course for two and one-half weeks. Then a diagnosis of subphrenic infection was considered. X-ray study by Dr. Bridenbaugh showed an elevated diaphragm and a gas shadow under the right diaphragm. This confirmed our diagnosis of subphrenic abscess of the right posterior superior space. Retro-peritoneal drainage was instituted by the method to be discussed. This resulted in the patient's recovery.

Prognosis

Many writers state that when abscess formation has once taken place, the mortality is close to 100 per cent without operation, whereas, in those in which

operation is performed, unless proper drainage is instituted, the mortality rate is 50 per cent or more. A careful analysis reveals the fact that the high mortality rate is due to delayed diagnosis resulting in the development of a marked toxemia which obviously decreases the patient's chance of recovery, and to contamination of one of the large serous cavities by draining the abscess through either the pleura or an unprotected portion of the peritoneal cavity.

Lockwood in 81 cases operated on had 27 deaths, a 33 per cent mortality; in 32 cases not operated, there were 31 deaths, a 97 per cent mortality. Judd reported a mortality ranging from 33 to 50 per cent, depending on the type of operation. Ochsner's series of 50 personal cases gave a mortality of 50 per cent in cases drained transpleurally, 41.6 per cent in cases drained transperitoneally, while those drained by extramembranous methods gave a mortality of 13.6 per cent; and in 31 cases in the right posterior superior subphrenic space, using his technic of the retroperitoneal operation, there was a mortality of only 9.7 per cent. In our series there was a general mortality of 14.3 per cent.

Operative Procedure

The last 20 years have witnessed a great improvement in the surgical treatment of subphrenic abscess and a drop in the mortality of operative cases to less than 20 per cent, when modern approved methods are employed. This improvement is an indication of the great interest and work recently done on this subject resulting in earlier diagnosis and treatment before the recuperative powers of the patient are gone. Russell in 1929 reported three cases in which a subphrenic abscess was not found until seven months, one year, and seven years following the primary causes. However, not many cases will live over a few weeks or months at the most after an abscess has formed.

A condition as serious as subphrenic abscess often requires rare judgment on the part of the surgeon in order to carry out the proper treatment. When once the diagnosis has been made, drainage must be instituted by the least dangerous route. The mortality figures just given indicate that some extra-membranous method of approach must be made in order to give the patient the best chance for recovery. Attacking an abscess through unprotected pleural or peritoneal membranes certainly invites disaster to an already debilitated patient. Various ingenious methods have been devised to drain these subphrenic abscesses enclosed in the thoracic cage. To do a transpleural operation invites a septic empyema. Yet the classical operation for years was to remove a section of two of the lower ribs and stitch the pleura to the diaphragm or pack the intervening space with gauze until adhesions formed, usually causing a week's delay before the second stage could be done. The operation carried a mortality of 50 per cent or more and is condemned by that fact, inasmuch as newer methods have been worked out that

give a much lower mortality. Any operation for the drainage of a subphrenic abscess through unprotected peritoneum is open to the same criticism. The attempted aspiration of pus from a subphrenic abscess is mentioned only to be condemned. There is grave danger of contaminating unmolested portions of the pleural and peritoneal cavities. Barnard reported a case in which, following the transpleural aspiration of a subphrenic abscess, the patient collapsed and died three hours later. At autopsy, one and one-half pints of pus were found to have leaked into the pleural cavity. This undoubtedly caused the patient's death.

Inasmuch as the right posterior superior space is the one most commonly involved—60 per cent of Ochsner's series of 50 cases—I shall direct my remarks chiefly to the treatment of abscess in this space.

In 1922, Nathar and Ochsner worked out a technic by dissections on the cadaver whereby abscesses in the right superior posterior space could be reached without traversing any serous membrane, pleural or peritoneal. Their contribution to this subject has meant the saving of many lives.

The operation is as follows: with the patient lying on the unaffected side as for a kidney operation, the anesthetic is begun, using preferably gas or paravertebral block. An incision is made over the course of the twelfth rib. A careful sub-periosteal resection of the entire rib is made. Inasmuch as the costophrenic angle reaches to the twelfth rib, the next step in the operation is very important. At the level of the center of the first lumbar vertebra an incision is carried transversely forward for three or four inches through the root of the diaphragm. This incision is deepened until the glistening renal fascia is in sight. Beneath it may be seen the renal fat, also the liver edge in front of the posterior peritoneum. Having cut across the root of the diaphragm, which may be very thin, two fingers are insinuated between the posterior peritoneum and severed edge of the diaphragm. A gentle dissection is now carried up until the posterior superior subphrenic space is reached. As the fingers advance, a hard area will be encountered, which is the abscess wall. This is perforated by the fingers, and the pus allowed to escape. Two drainage tubes are inserted to carry away the discharge, so that irrigations may be employed if necessary. Following Ochsner's suggestion, we have made it a habit of exploring the space in the renal pouch before emptying the upper abscess, inasmuch as both spaces may be involved. Should the case be complicated by empyema, as one of our cases was, it may be drained through the costophrenic angle in the same incision. Another advantage of this operation lies in the fact that sometimes an abscess in the right antero-superior space may be evacuated by this method. This is due to the fact that there is often a free connection around the edge of the liver with the other spaces on the right side.

Conclusions

Subphrenic abscess is not an uncommon condition. It should be considered as a possible complication in every intra-peritoneal septic process. The most frequent site is in the right posterior superior space. The ruptured appendix is the commonest offender. The symptoms are often vague in character suggesting an infection in the gallbladder region. Early diagnosis is frequently rendered possible by X-ray plates in the upright, lat-

eral and antero-posterior positions. The mortality approaches 100 per cent in cases not treated by operation; surgery offers the only chance for cure. Transmembranous methods of drainage are condemned. The extra-peritoneal operation recommended by Ochsner carries the lowest mortality.*

*I am greatly indebted to Dr. Alton Ochsner, Prof. of Surgery, Tulane University Medical School, New Orleans, La., for the use of his slides showing the steps of the extraperitoneal operation.

Nutritional Problems in University Students

By

Bernard I. Comroe, M. D.*

Philadelphia

THE most common nutritional problems met with in college students are obesity, under-nutrition (including vitamin and mineral deficiency), special dietary regimes in skin diseases, renal stones, pyelitis, epilepsy, gastro-intestinal disorders, and food allergy. The commonest of these is obesity. In examining the records of 1765 male freshmen entering the University in the years 1931 and 1932, Gammon¹ found 17 per cent of these to be 10 per cent or more overweight (11.7 per cent being from 10 to 19 per cent overweight, and 6.6 per cent more than 20 per cent overweight). In the absence of standard tables, Diehl² has suggested a method of calculating the standard weight based on the sex, height, and age of the individual. He analyzed³ the heights and weights of 40,000 male and female American college students and showed that as a group the college students are taller and heavier than males and females of corresponding ages in the general population.

We do not consider a patient obese unless he is 20 per cent or more above his standard calculated weight. In any obese individual, we record a careful history, and perform a thorough physical examination and any necessary laboratory tests. The history should inquire for a family history of obesity or endocrine disorders, sex history, weight curve, menstrual and marital history, habits of exercise, and sample diets. In the physical examination one should note the particular type of fat distribution, the condition of the hair and skin, areas of pigmentation, visual fields, breasts, gonads, blood pressure, thyroid gland, abdominal striae, and edema. A complete blood count, urinalysis, basal metabolism, and blood cholesterol should be routine on all overweight patients. If indicated, pituitary x-ray and glucose tolerance tests may be performed.

There is no evidence that obese individuals exhibit any specific inability to oxidize either fat or carbohydrate. Ogilvie⁴ found that glucose tolerance diminishes as the duration of simple obesity increases. Joslin considers that the obese individuals are 19 times as likely as persons of normal weight to develop diabetes arising he believes from prolonged excessive demands on the insular apparatus of the pancreas. Mendel⁵ has emphasized the enormous increase in sugar consumption in the past century. The consumption of sugar in 1823 was estimated at 8.8 pounds per year per person; in 1931, the per capita consumption amounted to 108 pounds. Himsworth⁶ suggests that diets with decreased carbohydrate and increased fat may be responsible for obesity and that the more fundamental association of diabetes is not with overweight, but with the diet which incidentally promoted obesity. Fellows⁷ has noted that the parents of overweight subjects showed an incidence of overweight 10 times greater than that of the general adult population. Both parents were overweight in 24 per cent of the cases.

Abnormalities which must be watched for in the obese include the not infrequent development of diabetes, gout, abdominal hernia, gall bladder disease, arteriosclerosis, hypertension, orthopedic difficulties, constipation, hemorrhoids, and disturbances in genital function. Furthermore, fatty tissues are notoriously susceptible to infection and to slow surgical healing.

In the dietary treatment of simple obesity, several courses are open. Some clinicians have recommended that the patient eat only half the quantity of food to which he was accustomed, and partake of no desserts prepared with flour or sugar. Harrop⁸ prescribed a total daily intake of 4 to 6 fully ripened bananas, plus a quart of skimmed milk or buttermilk. It has been our experience that the banana and milk diet does not

*Instructor in Medicine, Medical School of the University of Pennsylvania; Physician to the Student Health Service.

satisfy the appetite of the ordinary college student. Strang *et al*⁹ have utilized a low caloric diet supplying only the body requirements of protein, vitamins, and salts. This averaged 360 calories per day which were derived from 58 grams of protein, 8 of fat, and 14 of carbohydrate. On this regime 13 patients showed an average weight loss of 0.6 pound per day for 59 days. Clinically the patients were greatly benefited and showed no untoward reactions. Patients were maintained on this rigid diet without complications for 6 months; all were hospitalized during the course of the weight reduction.

In the University Health Service, given a case of simple obesity, our regime is as follows: the patient is given a diet list composed of 3 divisions, namely (1) "Eat none of the following," (2) "Eat all you desire of the following," and (3) "Eat moderate portions of the following." He is allowed no: potatoes, corn, rice, baked or lima beans, macaroni, spaghetti, noodles, gravy, cream, candy, cake, pie, nuts, peanut butter, preserves, cereal, cream soups, ham, pork, bacon, fatty fish, breaded meats, bananas, prunes, apples, fresh peas, liquor, or soft drinks. He may eat as freely as desired of: plain jello, plain broth or tomato soup, tomatoes, spinach, celery, radishes, lettuce, cabbage, sauerkraut, Brussels sprouts, cauliflower, asparagus, watermelon, strawberries, tea, coffee, and water. He is to take only average servings of: beets, carrots, turnips, pumpkin, squash, string beans, canned peas, oranges, meats and fish (as excepted above) cutting off the fatty portions, and of cottage cheese. One slice of bread is permitted daily with very little butter. If vegetables are served with cream sauce, he is to discard as much of the sauce as possible. The last few drops of butter in the vegetable dish must not be drained. A sample diet consists of: breakfast—half a grapefruit or orange, one slice of toast and a cup of coffee or tea with a small amount of milk and sugar; lunch—a cup of broth, lettuce and tomato salad with salt, pepper and vinegar dressing (or a platter of several 5 per cent vegetables), and jello; dinner—broth or plain tomato soup or tomato juice, ordinary helping of meat, large helpings of several 5 per cent vegetables and one 10 per cent vegetable, salad if desired (without mayonnaise) and either no dessert or jello or a low carbohydrate fruit. One essential of the diet is that the student eat plenty of the foods allowed him so that the sensation of hunger will rarely be present.

Under the above regime, the student with simple obesity responsive to diet will lose 5 or 6 pounds the first week, 3 or 4 the second, and about 2 pounds each week thereafter. The patient weighs himself daily on the same scales and at the same time of the day so that fluctuations in weight

due to bowel movements or meals will not be a major factor. The sense of satisfaction at the weight loss noted by the individual himself usually further stimulates him to adhere to the diet. During the period of weight reduction, the student prevents undue exposure to inclement weather and does not closely associate himself with individuals with respiratory infections. He performs his usual amount of exercise. In our hands, over exercising has led to a large appetite and seems undesirable. It is a fact little known that the energy consumed in certain forms of exercise is relatively small; a student weighing 70 Kg, in an hour's walk covering 2½ miles, would require only 140 calories¹⁰. If the patient is to be kept on this diet for a considerable time, he is given in addition viosterol and calcium phosphate. The student reports for a weekly checkup for the first month, after which he reports every 3 weeks. Weight reduction is attempted in easy stages. For example, if the ideal weight of a 240 pound student is 180, we set as our goal an initial loss of 30 pounds—6 pounds the first week, 4 the second, and 2½ pounds weekly thereafter so that in a period of 10 weeks, the individual has reached 210 pounds. He is then placed on a maintenance diet for a month so that his body might accustom itself to its new surroundings and to insure against vitamin or mineral deficiency. Following this, we attempt to affect a loss of an additional 15 pounds over a period of 8 weeks, to be again followed by a rest period of 6 weeks. Further weight reduction will then depend on the general appearance and condition of the individual.

Obese individuals frequently tell the doctor they do not overeat. Often they are telling the truth as they see it. In these individuals, one should always have the patient write down at the end of each day the quantities of all foods consumed during and between meals; this list, gone over at the end of a week, is of great value to the physician in checking the diet.

Occasionally, even though a student adheres to a low caloric diet, no weight loss may result during the first week. Newburgh and Johnston¹¹ have shown how unstable the organism is in regard to water, and that even when the body is in nutritional balance, it may increase or diminish its percentage of water from day to day. In the early phases of dieting, the individual may progressively retain water in his tissues. The water retention may neutralize the weight loss until, after a number of days, this extra fluid is given off.

To acquaint further the patient with dietary facts, he is given a list showing approximately 100 calorie portions of some of our common foods such as: a slice of bread, 3 graham crackers, 2/3 cup of cooked oatmeal, 1 shredded wheat biscuit,

1 large apple, medium sized banana, small glass of grape juice, 7 ripe olives, a very large orange, 3 peaches, a large pear, 2 servings of strawberries, a small ball of butter, a small glass of whole milk, a medium sized potato, a small lamb chop, a dozen oysters, *etc.* Another popular fallacy that must be explained is that all of our common breads (rye, white, or whole wheat) are of approximately the same food value. I have frequently had students tell me that they were eating absolutely no bread—*i. e.* only 2 or 3 slices of rye or whole wheat bread with each meal. It must also be emphasized that prunes are fattening, three prunes equaling a potato in calorie value.

A wide field for swindlers is present in the treatment of obesity. These individuals employ mechanical belts, purgatives, reducing breads, food powders, bath salts, and dangerous drugs. Most of the external preparations sold as pastes are merely a mixture of soaps. Chewing gums devised for reducing usually contain phenolphthalein or thyroid substance. Among other reducing fads are Germania tea (mainly senna), Jad salts condensed (a mixture of laxative salts), Kellogg's safe fat reducer (thyroid substance and pokeroor), Marmola (containing thyroid substance, and phenolphthalein), *etc.* One of the newcomers is "Hollywood Diet," a reducing food. This is essentially 2½ cents worth of soy bean flour, faintly flavored with cocoa and salt, and sold for 1 or 2 dollars. Its advertising states that "within 30 days you will thrill to your loveliest image; you will radiate a more slender charm." The directions recommend a teaspoonful instead of breakfast and another in place of lunch. A heaping teaspoonful is only 8 grams, a total breakfast and lunch of 32 calories!

We do not employ desiccated thyroid unless the basal metabolic rate is below minus 15 per cent and there is definite clinical evidence of hypothyroidism. If thyroid substance is used, the patient is seen twice a week and careful check made of the pulse, basal metabolic rate and general well being. We have discontinued the use of the dinitrophenols because of their dangerous complications such as cataracts, otitis media, and agranulocytic angina.¹²⁻²¹ Dinitrophenol now forms the basis of many patent medicines; slim, nitromet, dinitrolac, nitro-phen, dinitriso, formula 281, dinitrose, nox-ben-ol, re-du, aldinol, dinitronal, Rx No. 17, tabolin, and redusols.

There exists no good evidence with animals or in clinical observations that the addition of excess of any of the vitamins to the diet will increase the resistance to infection when the host has already been consuming a normal diet²². There is little reason to believe that the administration of vitamins after the onset of an acute infection will exercise any benefit on resistance. The public is

now being bombarded with ads hailing the anti-infective power of foods or drugs containing this or that vitamin.

Leanness, or underweight, may be a constitutional inheritance or may result from inadequate foods, improper eating habits, or from functional or organic disease processes in the body. A careful search must be made for evidences of organic diseases such as tuberculosis, diabetes, toxic goiter, smoldering rheumatic fever, subacute bacterial endocarditis, bronchiectasis, neoplasms, Hodgkin's disease and leukemia. Certain underweight individuals will not gain weight on a high caloric diet even when no disease process is present. In these there is often a family (one or both parents) history of failure to attain a normal weight. However, most healthy individuals can gain weight by eating a sufficient supply of the proper food. In college students, to combat undernutrition necessitates the eating of between 3500 and 4500 calories daily, together with appropriate stimulation of the appetite if necessary by tonics, fresh air, moderate exercise, extra feedings between meals, and occasionally insulin. A rest period of 10 or 15 minutes before and after meals is advised. Feedings such as orange juice to which 10 or 20 grams of lactose have been added, or a chocolate milk shake are often well tolerated. A new role for vitamin B, helping the body gain weight by building up fat is suggested by the experiments of Whipple and Church²³. The addition of half an ounce of olive or cod liver oil 2 or 3 times daily, if tolerated, is often of distinct value.

Special dietary regimes have been of benefit in many medical disorders. The occasional remarkable cures of acne vulgaris following a low carbohydrate diet or of psoriasis on a low protein diet are well known. A dietary aid often overlooked by physicians is the attempt to prevent further stone formation in individuals who may have had nephrolithiasis. A discussion of this subject is beyond the scope of this paper, but the reader is referred to the excellent work done along this line by Higgins^{24, 25}, and by Joly.²⁶

In chronic pyelitis and epilepsy, ketogenic diets have proved quite a valuable adjunct to our therapeutic armamentarium. Special dietary handling of gastro-intestinal diseases (duodenal ulcer, ulcerative colitis, catarrhal jaundice, acute gastroenteritis), anemia, and vitamin deficiencies is well recognized. One other important nutritional problem is food allergy. The most common offenders are wheat, milk, and eggs. Others include tomatoes, cabbage, chocolate, potatoes, oranges, shell fish, strawberries, and pork. Common symptoms of gastro-intestinal allergy are pain, nausea, vomiting, distention, constipation, or diarrhea. Urticaria is especially apt to follow fish, tomato, or cheese. Erythema or eczema may

occur after cereal, pork, or milk sensitization, while asthma not infrequently occurs as a reaction to egg protein. Especially useful in detecting these offenders are skin tests, elimination diets, and the decrease in the white blood count found after the ingestion of the causative agent. It is important to remember that an individual's sensitiveness to a given food may appear to develop suddenly and may be transiently or intermittently manifested.

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The Present Status of the Tuberculin Reaction

By

G. Alfred Dodds, M. D.*

San Haven, N. D.

OWING to the number of inquiries received from the public and from physicians throughout North Dakota regarding the tuberculin test, it is apparent that the true value and limitations of the test are not fully appreciated. The purpose of this paper, therefore, is to clarify various points about the test that it may be more intelligently interpreted and clinically correlated.

The Positive Reaction

The reaction of the skin to the injection of tuberculin is merely the reaction of a sensitized organism to tuberculo-protein and is an index of tuberculous infection past or present. At no time does it alone indicate an active disease process or the degree of tuberculous pathology present. These facts can be determined only by examination and X-ray. Furthermore, the intensity of the tuberculin reaction does not show any relationship to the clinical course which the disease will pursue. Stewart¹ illustrates this in his study of 188 children with a primary infection. This group failed to show any relationship between skin sensitivity to tuberculo-proteins and the extent of the intra thoracic lesions present.

The skin reacts positively to the injection of tuberculin about six weeks after infection of the individual with the tubercule bacillus². This sensitivity persists for varying lengths of time, but will be lost after one

and a half to two years in 4 per cent of the positive reactors³. This is further illustrated in the study of any large series of chest X-rays which show calcified hilar glands as evidence of a previous primary tuberculous infection. In such a group four to five per cent of these patients will be found to be negative tuberculin reactors.

One of the great values of the positive tuberculin reaction lies in the easy segregation of patients who have been infected with the tubercle bacillus. Such reactors can then be X-rayed for the presence or absence of actual pulmonary tuberculosis. Advantage should be taken of this in the study of school children, industrial groups, and institutional residents. In young children the positive reaction is extremely significant. As in the case of children over five years of age, such a reaction points to an open case of tuberculosis either in the school or in the home. In children under five years of age the source of infection is in 99 per cent of the cases in the child's immediate family.

It is true that the primary tuberculous infection (childhood tuberculosis) usually runs a benign course; however, in infants and young children a positive reaction is of grave significance. To prove this, I refer to the figures of the California State Board of Health for the years 1928 to 1932. These state that in children of one to four years tuberculosis was the most common cause of death and represented one-third of the total deaths in this age group.⁴ Of the deaths occur-

*State Sanatorium for Tuberculosis.

ring under five years of age the meningeal form accounts for 39 per cent.⁵ It is highly advisable, then, that in younger children known to have been in recent contact with an open case of pulmonary tuberculosis which on tuberculin testing shows a negative skin reaction, to repeat this test in two or four months. During this interval a positive reaction may develop thus changing the prognosis and saving the family physician from criticism in the event that the case has a fatal termination. It is further felt by some that in children the four plus tuberculin reaction is of definite clinical significance as it represents that group which has had recent or repeated infection.⁶ Special attention should be given to this group by yearly examination and X-ray.

It is well, at this point, to insert a word of caution about lightly dismissing the positive tuberculin reactor who shows on the X-ray enlarged or calcified hilar glands as previous evidence of a tuberculous infection. Many such patients are informed that their tuberculosis is "all healed" and that they are "to forget about it." Such statements are unreliable. A large percentage of the lesions referred to harbor viable tubercle bacilli which await the opportunity to multiply in a fertile field provided by lowered resistance and intercurrent infection. Our safest statement to such individuals is that their disease is 'apparently arrested.' In view of the ever present potentiality for tuberculosis to become active again it can almost be said, "once infected, always infected."^{7, 8} This, however, does not apply to the negatively reacting group which shows calcified hilar glands as evidence of previous infection with the tubercle bacillus for these are definitely and permanently arrested.

The Negative Reaction

Due to the prevalent conception that a negative tuberculin reaction may occur in active pulmonary tuberculosis little value has been placed upon the test in adults by many physicians. It is true that a negative reaction will occur in active pulmonary tuberculosis, but only as a terminal event in a patient whose X-ray presents a far advanced stage of the disease.⁹ For the general practitioner this phase of the reaction can be forgotten.¹⁰ However, it must be remembered that there is a marked decrease in skin sensitivity to tuberculo-proteins in scarlet fever and measles. This usually lasts one to two weeks after the rash appears. The effect produced is not specific but due to the local effect of the exanthems on the skin. Chickenpox, pertussis, and diphtheria do not have a depressing effect on the tuberculin reaction.¹⁰ This fact is well worth bearing in mind. A negative reaction has also been reported to occur in such conditions as lymphogranulomatosis, diseases of myeloid and lymphoid tissue, and in patients with malignant disease.¹¹ Nevertheless, at this institution we have been unable to confirm this in one patient having a moderately advanced pulmonary tuberculosis with chronic myelogenous leukemia, and in another patient presenting a hopelessly far advanced stage of the disease with an ex-

tensive carcinoma of the cervix. Others have reported the depressing effects of X-ray therapy on skin sensitivity. In the absence of the foregoing, the negative tuberculin reaction in a patient with suspicious clinical symptoms and dubious X-ray findings definitely rules out tuberculosis.

In the face of X-ray findings which simulate pulmonary tuberculosis the physician's attention is then directed to other types of pulmonary disease. This is likewise true in patients in whom an extrapulmonary form of tuberculosis is considered. This fact is clearly revealed in Table 1 in which the initial and final diagnoses of 13 patients not having tuberculosis is compared. All of these patients were admitted to the sanatorium with a diagnosis of either pulmonary or extra pulmonary tuberculosis. In each instance the negative tuberculin reaction was of the utmost value in arriving at the correct diagnosis and institution of proper treatment. This table does not attempt to include a large group of patients with negative tuberculin reactions originally admitted as tuberculous who were found to have had recent nonspecific respiratory tract infections, bronchitis, sinusitis, chronic tonsillitis, or undulant fever. In connection with the foregoing, it is of interest to note that of the patients admitted to the state sanatorium and found to be nontuberculous 90% had never been tuberculin tested previous to admission. This indicates a definite neglect on the part of the referring physician.

While it is true that individuals dwelling in metropolitan areas will show a higher incidence of positive tuberculin reactions than those in rural communities, yet the negative reaction does appear often enough to warrant tuberculin testing in patients not presenting definite manifestations of tuberculosis. This is particularly true in pulmonary conditions, for in this group of cases I feel that the failure to find sputum containing tubercle bacilli is a definite indication for tuberculin testing. The value of the negative Mantoux test has been further emphasized by Lichtenstein¹² who states, "the negative tuberculin test rules out tuberculosis as much as organisms in the sputum rule it in."

In view of the fact that the laity still attach a definite stigma to tuberculosis, it is well then to be certain that some other form of pulmonary pathology is not being dealt with before the patient is referred to a sanatorium. Even though such an individual is proven to be nontuberculous at the sanatorium his or her associates continue to feel tuberculosis is present and that such a person is to be avoided in the future. The practitioner, then, will benefit both the patient and himself by the performance of a tuberculin test in patients under suspicion.

Technic and Interpretation of the Test

The intracutaneous tuberculin test (Mantoux) is the most accurate and best controlled of all tests. It is the only one recommended. Previously, old tuberculin was used for testing, but in the past two years a new type of tuberculin known as P. P. D. (purified protein de-

CHART No. 1—Showing the value of the negative tuberculin reaction as an aid in differentiating conditions which simulate pulmonary and extra pulmonary tuberculosis.

Case Number	Age	Admission Diagnosis	Tuberculin Test	Sputum	Remarks	Final Diagnosis
3646	17	Pulm. Tubc. far adv.	Negative	Negative for T.B.	lipiodol injection	Bronchiectasis bilateral basilar
3689	24	Tuberculous empyema	Negative	Negative	Pneumococci in aspirated pus.	Empyema-post pneumonic
3697	19	Tuberculous Pneumonia	Negative	Negative		Lobar Pneumonia delayed resolution
3736	59	Pulm. Tubc. far adv. Tuberculous empyema	Negative	Negative	Guinea pig neg.	Chronic pyopneumothorax. Non-tuberc.
3765	14	Pulm. Tubc. mod. adv.	Negative	Negative	. . . .	Rheumatic endocarditis, Cardiac decompensation
3791	61	Tuberculous adenitis	Negative	Negative	Biopsy	Hodgkin's disease
3794	18	Pulm. Tubc. far adv.	Negative	Negative	Pneumococci in aspirated pus.	Empyema-postpneumonic
3838	22	Pulm. Tubc. far adv.	Negative	Negative	Lipiodol injection	Saccular bronchiectasis advanced—left lung
3863	18	Tuberculous spondylitis	Negative	Negative	. . . .	Thoracic scoliosis post-poliomyelitic
3887	10	Pulm. Tubc. mod. adv.	Negative	Negative	Lipiodol injection bronchoscopy	Bronchiectasis, bilateral, basilar
3937	19	Pulm. Tubc. mod. adv.	Negative	Negative	Sputum culture bronchoscopy	Pulmonary streptothricosis
3938	38	Pulm. Tubc. minimal	Negative	Negative	. . . .	Bronchial Asthma
3942	32	Tuberculous arthritis	Negative	Negative	. . . .	Infectious arthritis secondary anemia

rivative) has appeared. It is prepared by precipitating with trichloracetic acid the active protein in a tuberculin obtained from tubercle bacilli grown on synthetic media. This precipitate is then washed with ether and dehydrated. This represents a stable purified tuberculo-protein of uniform potency.¹³ It is marketed in tablet form with a sterile diluent to be added at the time of its use. This tuberculin is obtainable in five or 100 test sizes. The initial intracutaneous dose is .0002 mgm. in .10 cc. and .05 in 10 cc. as the second dose. If the test is negative in 48 hours the second dose is then administered. This new material offers an easily prepared fresh tuberculin for testing purposes. Owing to its uniform potency a large number of extensive reactions previously seen with old tuberculin are eliminated. The test is easily interpreted and owing to the uniformity of the dosage an accurate check is possible in each patient at various intervals regarding the degree of hypersensitivity remaining to tuberculo-proteins. Controlled dosage also permits accurate epidemiologic studies.

The site of injection, which is usually the forearm, is examined at the end of 48 hours. In interpreting the reaction, mere redness at the site of injection is disregarded. Edema is the most important diagnostic sign and should be looked for. The reactions are graded as one plus where there is slight edema measuring not more than 10 mm. across although the area of redness is usually larger; two plus represents a well defined edema of 10-20 mm.; three plus is an extensive edema,

redness and an area of central necrosis. This reaction may be accompanied by constitutional symptoms. When both first and second strengths have failed to elicit a reaction the test is considered negative.

The type of tubercle bacillus being dealt with in any given case can not be determined from the tuberculin reaction. This is due to the fact that tuberculin obtained from the human tubercle bacillus produces skin reactions of equal intensity in those patients having an infection with the bovine type of tubercle bacillus and *vice versa*. Some of the early workers on purified tuberculo-proteins well illustrated this fact and concluded that there was a protein substance common to all acid fast bacilli¹⁴.

Summary

The correct evaluation of the positive and negative tuberculin test is discussed with emphasis made on the prognostic importance of the positive reaction and the diagnostic value of the negative reaction. The latter is illustrated by an analysis of 13 cases originally admitted to the sanatorium as tuberculous and later shown to be nontuberculous. The arrival at the correct diagnosis was facilitated in each instance by the negative Mantoux reaction.

More extensive application of the tuberculin test is recommended particularly in adults in the hope that conditions resembling pulmonary tuberculosis will be more correctly diagnosed.

The advantages of the new tuberculin P. P. D. (purified protein derivative) are discussed and the value of controlled dosage with this tuberculin is emphasized.

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Acute Infectious Mononucleosis

Value of the Non-filament Count in the Differential Diagnosis

W. H. York, A. B., M. D.*

P. W. Eckley, B. S.*

Ithaca, New York

DURING the ten-year period, (1926-1936), the Student Health Service of Cornell University has had under observation fifty-five cases of infectious mononucleosis. Twenty-four of these cases were observed and studied during the present academic year, which might be looked upon as a mild epidemic. The majority of the cases were sporadic in type, occurring throughout any one school year with very little relationship to the season or any infectious conditions prevalent at the time, such as epidemics of influenza, measles, etc.

It is interesting to observe this year that there has been a high incidence of hemolytic streptococcus cultured from the throats of both well and ill students. Over 50 per cent of students passing routinely through the medical office, showed a positive culture of hemolytic streptococcus. Nine out of eleven nurses at the Infirmary gave a positive culture, and many of the patients confined to the Infirmary, regardless of their illness, showed positive cultures. Whether this has any relationship to the disease in question, is problematical.

The importance of infectious mononucleosis does not lie in the severity of the infection, since it is a relatively benign disease, but in the confusion that attends a differential diagnosis from other serious diseases, such as acute leukemia and acute infectious conditions in general. The authors in presenting a review of their findings admit their inability to contribute any new knowledge to the etiology, but hope to add to the general picture of the symptom complex and stress the importance of routine blood examination in all suspicious cases, with particular reference to non-filament counting as a differential and diagnostic procedure.

*Student Health Service, Cornell University.

From the time of Pfeiffer's description of glandular fever in 1889¹ there has been an increasing interest shown in this apparently benign, but at times, confused symptom-complex. That it has the earmarks of a disease entity, was brought out by the excellent study of Longcope in 1922² when he reported on ten cases. More recently Gilbert and Coleman (1925)³; McAlpine (1935)⁷ and McKinley, Downey and Stasney (1935)^{8,9} have given a more complete clinical and blood picture of this disease, and have not only made a careful review of the literature, but have clarified through their own studies certain aspects of the clinical picture.

Our own study of 55 cases has checked well with the findings of other observers: namely, the sporadic nature, the prevalence among the adolescent group, symptoms of a mild acute infection; the clinical findings of enlarged and tender lymph nodes, palpable spleen, body rash and a characteristic blood picture showing an increased white blood count varying from a relative to an absolute increase of lymphocytes.

The symptoms characterizing the onset of illness in their order of frequency, were as follows: sore throat, indigestion and headache, enlarged lymph nodes, malaise, fever and chills, coryza, and in one case fainting. The onset may be sudden with a relatively high fever, either of the septic type, or one well sustained for a few days. In such cases chills are frequent with many of the symptoms observed in the severe acute infections, such as headache, nausea, vomiting, malaise, etc., but there are no localized signs of infection. A second type of onset is with fever and sore throat, the febrile reaction being less pronounced than the first type, constitutional symptoms are less marked and few lymph nodes

are enlarged. Still a third type of onset, is with mild fever and many enlarged, tender lymph nodes. Occasionally the onset has been ushered in with abdominal symptoms and mild fever. During the course of the disease sweating is a common complaint and in some cases a diffuse macular rash has appeared on the face and body. Rarely is the rash seen below the iliac crest. Eight cases of our series showed this rash.

The average length of time required for hospitalization was 12.6 days. There was no relation between the acuteness of the onset and the length of time required for convalescence. In a few cases too early discharge from the Infirmary resulted in re-admission of the patient. In a considerable number of the patients who were discharged with a normal temperature, complaints of weakness and fatigue persisted for some time, indicating that complete convalescence may be delayed for several weeks or even months.

The blood picture in the following representative cases is given to show the value of the high non-filament count in making a diagnosis of acute infectious mononucleosis. Attention is also called to the fact that often several white blood counts with a differential count must be made before the typical picture of leucocytosis and lymphocytosis appears. Frequently the first counts may show a leucopenia and this was marked in Case 3 of W. H.

Common Clinical Types

Case 1.—J. S.—Male student. Age: 21.

Admitted to the Infirmary with the complaint of headache and sore throat 2/11/35. Time in the Infirmary, 18 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
2-15-35	7,400	63.5	36	0.5	0	39	101
2-18-35	7,800	46.5	52.5	.5	.5	74	102.4
2-20-35	7,720	42	57	1.0	0	79	99.4
2-21-35	15,040	31.5	65	2.0	.5	76	98.6
2-25-35	18,640	29	70	1.0	0	64	98.6

Case 2.—G. L.—Male student. Age: 20.

Admitted to the Infirmary with cold, coughing, abdominal pain, headache and rash 1/8/34. Time in Infirmary, 10 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
1-11-34	5,560	57	42	0.5	0.5	78	102.6
1-12-34	5,800	48	52	0	0	77	101
1-15-34	11,280	33	67	0	0	58	98
1-18-34	13,240	51	49	0	0	45	98

Case 3.—W. H.—Male student. Age: 24.

Admitted to the Infirmary 4/17/35 with symptoms of grippe. Had been ill for past several days. Time in Infirmary, 18 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
4-19-35	6,520	74	26	0	0	20	103
4-21-35	2,450	35.5	63.5	.5	.5	29	104.4
4-22-35	7,420	42.5	56.5	1	0	38	102.6
4-23-35	10,360	34.5	64.5	1	0	28	101.2
4-24-35	9,600	28.5	70	1	0.5	29	100.8
4-25-35	10,520	32	67	1	0	15	101.6
4-26-35	9,600	29	71	0	0	24	102
4-28-35	16,600	23	77	0	0	30	103.4
4-29-35	22,400	28	70.5	1	0.5	32	102.2
4-30-35	21,400	20	79	1	0	33	99.2
5- 1-35	16,400	14	85	.5	.5	25	98.6
5- 2-35	15,080	20	79	1.0	0	..	98.6
1- 7-36	10,200	53	44.5	2.5	0	11	.....

Case 4.—Mrs. J.—Female student. Age: 23.

Admitted to the Infirmary 1/20/34 with fainting, pain in abdomen, chills and general malaise. Complained of stiff neck. Time in Infirmary, 14 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
1-22-34	6,000	33.5	63.5	2	1	89	99.4
1-23-34	4,960	32	65.5	2.5	0	86	99.6
1-24-34	8,760	35.5	60.5	4	0	80	100.4
1-25-34	10,800	38.5	59.5	1.5	.5	86	100.4
1-26-34	13,640	40	56.5	3.5	0	76	99.4
1-27-34	13,600	38	59	2.5	0.5	74	100
1-28-34	12,640	40.5	57.5	2	0	61	99.2
1-29-34	13,240	31	65.5	3	0.5	51	99.4
1-30-34	10,880	27.5	66.5	6	0	44	98.8
1-31-34	12,160	29	67	3.5	0.5	50	98.6
2- 1-34	13,600	34	64	2	0	62	98.6
2- 3-34	16,040	31.5	66	2.5	....	55	98.6

Case 5.—M. D.—Male student. Age: 22.

Admitted to the Infirmary 11/10/35 with cold, fatigue and sore throat. Time in Infirmary, 21 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
11-15-35	8,800	21	75.5	3.5	0	64	100
11-16-35	9,400	25	73.5	1.5	0	60	100.4
11-18-35	11,800	11.5	88	0	0.5	68	100
11-22-35	11,720	10	89.5	0.5	0	76	101.2
11-23-35	18,240	10.5	89.5	0	0	67	101
11-25-35	12,600	17	83	0	0	67	103
11-26-35	16,400	15	85	0	0	53	102
11-27-35	11,960	16	83.5	0.5	0	50	99.4
11-29-35	7,400	10.5	89.5	0	0	53	99
1- 7-36	6,480	48	51.5	0.5	0	26	98.6

Widal and undulant fever agglutination negative 11/14/35.

Positive agglutination for infectious mononucleosis 11/22/35.

Case 6.—R. S.—Male student. Age: 24.

Admitted to the Infirmary 11/9/35 with sore throat and swollen glands. Time in Infirmary, five days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
11-11-35	7,000	20	75.5	3	1.5	87	100.4
11-12-35	6,640	25	69	5.5	0.5	65	98.2
1-20-36	11,400	56.5	40	2.5	1	8	.....

Case 7.—S. M.—Male student. Age: 19.

Admitted to the Infirmary 11/29/33 with the complaint of nausea and vomiting, general abdominal discomfort and slight headache. Time in Infirmary, 11 days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
12- 3-33	4,800	49	50.5	.5	0	56	99.8
12- 4-33	7,000	32.5	67	.5	0	48	98.6
12- 5-33	9,480	20.5	79.5	0	0	33	98
12- 7-33	7,600	41	58.5	0	.5	12	97.8
12- 9-33	8,400	41.5	58.5	0	0	13	97.8

Clinical symptoms characterized by macular rash on back and abdomen.

Case 8.—G. C.—Male student. Age: 19.

Admitted to the Infirmary 1/15/36 with rash and sore throat. Time in Infirmary, nine days.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
1-16-36	4,080	48	50	2	0	54	.....
1-17-36	4,680	60.5	37.5	2	0	55	.....
1-18-36	5,960	45.5	53.5	0.5	0.5	50	.....
1-20-36	9,200	33.5	66	0.5	0	45	.....
1-21-36	6,480	44.5	55	0.5	0	22	.....
1-22-36	6,960	33	66.5	0.5	0	23	.....

Case 9.—A. S.—Female student. Age: 20.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
2-25-36	12,000	32	66	1.5	0.5	34	.....
2-26-36	15,320	25.5	71.5	2.5	0.5	41	.....
2-28-36	8,840	25.5	74	0.5	0	46	.....

Positive agglutination 3/1/36.

Case 10.—E. W.—Male student. Age: 23.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
2-24-36	7,440	52	48	0	0	38	.....
2-25-36	6,240	46.5	53	0.5	0	50	.....
2-26-36	6,000	55.5	41.5	3.0	0	47	.....
2-27-36	7,200	60	37.5	1.5	1	42	.....

Positive agglutination 3/1/36.

Macular rash on back and abdomen.

Case 11.—J. G.—Male student. Age: 24.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
2-21-36	4,920	26	73	1	0	34	.....
2-22-36	4,520	30	68	2	0	34	.....
3-24-36	7,840	36.5	59	4.5	0	16	.....

Positive agglutination 2/23/36.

3-24-36 follow-up note: Tires easily—"Not up to par."

Case 12.—W. L. B.—Male student. Age: 20.

Date	W.B.C.	Poly.	Lymph.	Eos.	Bas.	N.F.	Temp.
2-18-36	16,120	26	74	0	0	73	.....
2-19-36	17,240	14	84.5	1.5	0	58	.....
2-20-36	17,280	20.5	79.5	0	0	64	.....
3-14-36	7,720	65.5	32.5	2	0	23	.....

Positive agglutination 2/22/36.

Filament—Non-filament Count

This method of studying the significance of the appearance of the nuclear structure of neutrophils, was proposed by Farley, St. Clair and Reisinger.⁵ They used the criterion of Krumbhaar¹⁰ and Cooke and Ponder.¹¹ The former had made a division of the neutrophils into three classes: (1) metamyelocytes, (2) the non-segmented types and, (3) the segmented forms; the latter had pointed out that all divided nuclear masses were connected by a thin filament of nuclear material, but they used a five-type classification. Combining these two systems, Farley, St. Clair and Reisinger divided the polymorphonuclear neutrophils into two classes: the non-filamented immature forms, and the filamented mature forms.

The method consisted of making thin smears, stained with Wright's stain. We used the modification as suggested by Mullin and Large,⁶ and have based our figures on a count of a hundred polymorphonuclear neutrophils. The upper limit of normal for young forms (non-filament) is 16

per cent. The average for normal adults is eight per cent.

Discussion and Conclusion

Non-filament counts of 50 per cent and over, usually indicate unfavorable prognosis. The high non-filament count in acute infectious mononucleosis is one of the few exceptions where "shift to the left" has a favorable omen. The consistency with which the high count appears in the blood picture of this relatively benign disease entity, is of considerable diagnostic importance, particularly in the differentiation from acute leukemia and other infectious diseases involving adenopathy, fever, and an increase in mononuclear elements in the blood.

Although the causative agent of infectious mononucleosis is unknown, the fact that we are able to get a positive agglutination in a considerable proportion of cases, would probably indicate the presence of a specific antigen. Sheep cell agglutination tests may be used as an additional laboratory aid in a differential diagnosis.

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Laboratory Assistance to Physicians*

by

Melvin E. Koons, M.S.**

Grand Forks, North Dakota

VICTOR C. VAUGHAN, in an editorial published in the October, 1915, issue of *The Journal of Laboratory and Clinical Medicine*, said that he who practiced medicine without the aid of a laboratory belonged to a past generation of physicians. Granting the truth of this statement then, we know that it is doubly true now.

Thirty or 40 years ago, laboratory tests were looked upon with only the mildest curiosity; today every hospital, clinic and physician finds it advisable and necessary to conduct routine and special laboratory tests.

Before the germ theory had been advanced, physicians were striving to learn the causes for epidemics of communicable diseases. Miasmatic conditions, unsanitary environment, poor housing, etc., were looked upon as factors causing these epidemics.

Eventually, after a period of hard struggles to find the cause of the destructive agencies, the laboratory and microscope came into use, and it was found that diphtheria was a germ disease with certain characteristics, and that typhoid fever was a germ disease transmitted through various agencies, mainly polluted water, unsanitary milk or contaminated food. Out of all this came a constructive public health program.

We all recognize now that public health is of vital concern to the state's welfare, and one of the many provisions aimed at fortifying and improving health conditions is the laboratory.

Even today a practical handicap which is experienced by the physicians practicing in the rural communities and remote areas, is the difficulty and often, impossibility, of obtaining the kind of clinical laboratory service to which their more fortunate brothers in larger cities and medical centers are accustomed, and which is considered by them essential in the proper practice of medicine. Doctors who are trained in the fundamentals of laboratory medicine truly appreciate the value of good laboratory work in routine clinical diagnosis.

The laboratory should be an important cog in the daily running of a physician's life, whether it be the state laboratory or not. It is, or rather should be, just as important to the physician as gasoline is to an automobile. In other words, an automobile cannot run without the proper fuel—so it is with a doctor. The laboratory serves in a way as fuel by helping the physician run and maintain his daily practice. The laboratory serves a two-fold purpose, not only does it help the physician in making positive diagnoses on borderline cases, and as a check on his clinical findings, but it also serves as a place where research can be conducted which will in the future be some aid to the medical profession.

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**Assistant Director State Public Health Laboratory, Grand Forks, N. Dak.

In the running of the state laboratories, several questions come to my mind. First, just what does the physician expect of the laboratory? Second, what does the laboratory expect of the physician? Let us consider the first question. Primarily, the physician expects prompt, efficient and reliable results on all specimens submitted to the laboratory for examination. Naturally, if the laboratory were slow in reporting specimens and were unreliable, the physician could not be blamed for not making use of the laboratory.

The laboratory also gives invaluable service in connection with control of treatment detection of carriers and the release from or the beginning of quarantine.

In the control of treatment of certain diseases, such as gonorrhea and syphilis, the laboratory can be of service to the physician by running examinations on specimens submitted at intervals during the treatment period. This will enable the physician to get a better picture of his method of treatment. The detection of carriers, especially typhoid, is practically impossible without the aid of a laboratory. We can only suspect a typhoid carrier if no laboratory examination is made. However, if urine and stool specimens are submitted to a laboratory, one can tell with some degree of accuracy whether or not the patient harbors and disseminates the specific microorganism. If typhoid bacilli are isolated we have definite proof that that particular person is a carrier.

In the same way a laboratory is needed when it comes to releasing a typhoid patient from quarantine restrictions. How can anyone positively say after waiting the required quarantine period that a typhoid patient is not still disseminating the germs? Let us take a specific example: Patient Jones has typhoid and makes a normal recovery; the quarantine period is up, so he is released without further examination; this patient although perfectly well has become a carrier, yet he is released without having either his urine or feces, or preferably both, examined. You can well appreciate the potential danger that this patient will be in his community. Here is a case where if urine and stool specimens were submitted to the laboratory, the chances are that the organisms would be isolated, thus preventing any uncalled-for inconvenience or even a serious epidemic.

Another example of the need of a laboratory is found in certain cases of diphtheria.

Many doctors do their own microscopic work or have a technician who examines for diphtheria bacilli, which is perfectly all right. However, they are not equipped to run a virulence test if such is necessary. A person may harbor organisms in his throat which upon microscopic examination conform morphologically to the diphtheria bacillus, and yet are non-virulent. If such be

the case, a patient might well be quarantined, causing a great inconvenience and possible economic loss.

Cases such as these which I have just mentioned are only an example of a few instances where a laboratory can be of great aid to a physician.

North Dakota has two state laboratories; one located in Grand Forks and the other in Bismarck. The laboratory service is without expense to the physician or patient, as no charge is made for examinations or supplies furnished. The department furnishes special approved mailing containers. The regulations of the postoffice department specifically require the use of containers which have been approved by the postal authorities for the mailing of infectious disease specimens. These may be procured by making application direct to the laboratories. The physician must pay all transportation charges for sending specimens to the laboratory.

With this in mind, it might be of interest to explain briefly some of the work done in the state laboratories. We are at the present time equipped to run a large variety of examinations. In fact, we do about everything that is done in other state laboratories. All specimens when received are immediately given the proper attention, with each individual specimen being given a thorough examination and a report that is reliable. In a great majority of cases, reports on specimens are mailed within 15 to 18 hours from the time of receipt; but material which is to be cultured may require a period covering 24 to 36 hours before diagnosis can be rendered. Reports are made to physicians directly, unless otherwise instructed by them. The scope of laboratory work includes such things as bacteriological diagnosis in diphtheria, tuberculosis, typhoid fever, paratyphoid fever, dysentery and meningitis; serological diagnosis in typhoid, paratyphoid, dysentery, undulant fever and tularemia; bacteriological examination of water and milk and venereal disease service which includes Kolmer and Wassermann tests, Kahn precipitation, darkfield examination, colloidal gold test and bacteriological diagnosis for gonorrhea infection, and the examination of feces and urine specimens. The laboratory also does guinea pig inoculations for tuberculosis, for which there is a nominal fee.

The report blanks now in use in the laboratories have an explanation or interpretation of the phraseology used by the laboratory in reporting the findings on any given submitted specimen. We feel that this is of some benefit to the physician and will not cause him any inconvenience or delay in trying to interpret our reports.

In the submission of specimens there are certain things which should be adhered to. Diphtheria cultures should never be submitted on old Loeffler's media, as a negative diagnosis is never given on specimens sent in any other way than on fresh culture media. A report of "diphtheria" means that *B. diphtheriae* were found in the specimen submitted. "No diphtheria bacilli found" does not necessarily mean that the patient does not have diphtheria; but means simply that diphtheria bacilli

were not found in the specimen examined. This may have been due to, first, improper technic in applying the swabs to nose and throat, or to the surface of the culture medium and secondly, overgrowth of certain bacteria capable of retarding the development of *B. diphtheriae* in vitro. A report of "Reserved" means that no diagnosis could be given, and other cultures are necessary for bacteriological diagnosis or release from quarantine. The "Reserved" diagnosis may have been due to, first, suspicious bacilli, secondly, saprophytic bacteria which liquefy the medium, or otherwise mask *B. diphtheriae*, or thirdly, scant or no growth, which may occur when dry medium is used, or when antiseptics have been applied to nose or throat a short time before taking of the specimen, or when the medium has not been satisfactorily inoculated. Convalescents should not be released from quarantine until two negative cultures, taken at intervals of 24 hours, are found.

Sputum specimens should be submitted in public health containers, as they contain a small amount of carbolie acid which not only preserves the specimen in transit, but also serves as some protection to those handling the specimen. All sputa are examined microscopically and a report of "tubercle bacilli present" indicates tuberculosis and that the discharges of the patient are dangerous to the public. "Tubercle bacilli not found" may be explained by one of the following reasons: first, the disease is in an early stage before the tubercles have begun to break down; secondly, the avenues through which the bacilli pass from the lesions to the sputum are temporarily blocked or the lesions have been healed; thirdly, so few bacilli are present as not to be found in careful examination of several smears, and fourthly, the patient is not tuberculous. Physicians should disregard negative reports as valueless unless confirmed by repeated physical examination, prolonged temperature record, clinical history, etc., and should send other specimens.

The laboratory furnishes a specially-prepared blood culture outfit for *B. typhosus*. During the first week of illness frequently typhoid organisms can be isolated from the patient's blood stream. Usually after the seventh to tenth day of illness, agglutinins appear in the blood, and then the Widal test may reveal the infection. The Widal test will be made on either wet or dried blood, although 3 to 5 cc. of blood are preferred for making accurate dilutions of the serum. A laboratory report of "present" may indicate the patient now has typhoid fever, recently had typhoid fever, is a typhoid carrier with infection of the gall bladder, or had some other latent or obscure focus of infection with *B. typhosus*, unless the reaction is due to the previous administration of typhoid vaccine.

An "atypical" report frequently occurs as a forerunner to "present" during the first week of typhoid fever. "Present" usually appears in 7 to 10 days after onset, as the specific agglutinins recede following recovery from typhoid fever, or as an indication of the carrier state. Too little blood, wet blood, or the presence

of foreign material, may give rise to an "atypical" reaction.

An "absent" report may indicate the absence of typhoid infection, or that it is too early in the disease for the appearance of the reaction.

For the examination of specimens for undulant fever and tularemia, 3 to 5 cc. of whole blood are required. The agglutination test is the recognized laboratory procedure for confirmation of clinical diagnosis.

Brucella and *tularensis* agglutinations should be interpreted in general in a manner similar to that of typhoid as just mentioned. "Present" 1:80 and above, with *Brucella* and "present 1:40" and above, with *tularensis* are diagnostically significant in the presence of clinical symptoms. A transient or persistent agglutination with *Br. melitensis* (*abortus*) antigen in a titre of less than 1:80 or with *Bact. tularensis* in a titre of less than 1:40 may be regarded as having little, if any significance in relation to the present illness. Agglutinations of low titre occur early and late in these diseases. Even high titre reactions may persist for years after an attack of tularemia. *Brucella* agglutinin is usually present in two to four weeks after onset, may not appear for several months and rarely is not demonstrable. *Tularensis* agglutinins are usually present in 10 to 20 days after onset. In either *Brucella* or *tularensis* infection, cross-agglutination with the opposite organisms may occur in a low titre, and rarely in typhoid and other infections a *Brucella* cross-agglutination may take place.

For Vincent's angina, the causative organisms are easily detected in smears made directly from the mucous membrane of the affected parts. Such an examination is reported as organisms characteristic of Vincent's angina are present or not found.

For spinal fluids, unless definite examination is stated, we run a routine examination which consists of a microscopic examination, culture of specimen, sugar and globulin determinations. If a guinea pig inoculation, colloidal gold, or Wassermann is desired, the specimen should be so marked. An attempt is made to isolate and identify all organisms found in a spinal fluid. Reports on such specimens are always by letter, giving a concise report of the findings.

For gonorrhea, a microscopic test of suspected material from both male and female is the recognized method of diagnosing the disease. Smears should be allowed to dry in the air before being submitted to the laboratory. Such an examination is reported as follows: "Organisms corresponding morphologically and in staining-reaction to the gonococcus are present," which means that while it is impossible to make an absolute identification of these organisms on microscopic examination alone, without further study of the biological characteristics, they are considered to be diagnostic of gonococcus infection. "Organisms corresponding morphologically and in staining-reaction to the gonococcus not found" means that while such organisms have not been found in the smear submitted, the possibility of gonococcus infection is not excluded. This may be due to, first,

organisms not being contained in the material on the slide even though they might be present in other smears taken at the same time; secondly, organisms being so few in number that a thorough search fails to reveal them. A suspicious report is given when gram negative diplococci characteristic of the gonococcus are found extra-cellularly along with the presence of pus cells.

"Examination unsatisfactory" may be due to: too little material submitted, too thick a smear, smears not being thoroughly air-dried before packing, or smears being overheated.

For the examination for syphilis the laboratory runs both a complement fixation and precipitation test. Approximately 5 cc. of blood are necessary for the test. The Kolmer test as used in the laboratory is a modified Wassermann test, which is widely-used and consistently gives a high degree of accuracy. The Kahn test, which is a precipitation test, is considered a good companion test to the Kolmer, as it occasionally picks up a primary case and a return positive reaction after cessation of treatment earlier than the Kolmer.

The laboratory furnishes small sterile glass vials which should be used in submitting blood specimens for examination. Physicians should avoid the use of miscellaneous bottles in submitting blood specimens. Much injustice has been done serologists, particularly by isolated practitioners, in criticizing reports based on thoroughly unsatisfactory material submitted for examination. Hemolyzed specimens are unsatisfactory for diagnosis. Water, extremes of heat or cold, age of specimens, and unclean utensils predispose to hemolysis.

A report of "anti-complementary" means that the test has been attempted; but due to certain factors inherent in the specimen, such as contamination by bacteria, or the use of non-sterile instruments in the collection of blood, etc., the result is of no value.

A "Kolmer doubtful" means that the test does not show complete negative or definite positive. This reaction may be due to some error in technic, to the condition of specimens or to the effect of treatment. It is always best to repeat tests on such a report except in cases under treatment.

A single negative report of blood serological test by any procedure, no matter what claims are made for it, means just nothing. A negative serological test always requires interpretation, clinical and also serological. All negatives should be repeated at least once if clinical suspicion warrants.

A positive test should not be accepted without one repetition. A diagnosis of syphilis should not be made on one positive if the history and clinical evidence are negative; or *vice versa*, repeated specimens should be submitted. In practical terms, it may be said that no patient should be given his diagnosis or placed on treatment on the strength of a single positive serological test any more than on the strength of a single negative one. False positives in good laboratories run between 0.5 and 2 per cent. John H. Stokes in his latest book on *Modern Clinical Syphilology* lists a summary of limitations and possibilities in serological test control (labora-

tory phase) which I quote here in part as follows: "The physician's desire for consistent 100 per cent specificity and sensitivity, and absolutely clear-cut reports cannot be met by any serological test for syphilis in routine performance today. Disagreements must be expected between antigens in the same Wassermann test; between the results of two or more tests in the same laboratory on a single serum; this is true sometimes even when the tests are of markedly different type as in Kolmer, Wassermann and Kahn precipitation tests, or when they are similar (Hinton and Kline); when the same serum is tested in two different laboratories, even by supposedly identical methods; when the serum of late and latent syphilis or syphilis in pregnancy is tested by any group of different methods (serological discord); when the serum of the same patient is repeatedly tested by identical methods on successive days or at longer intervals; when the treatment has intervened to alter the routine expectancy. The frequency of disagreement and the margin of inevitable error diminishes with the perfection of technical performance, but it has never completely disappeared. Essential elements in securing maximum reliability in performance by the laboratory are: a good specimen, experienced technical service, clean glass; fresh animals (Wassermann test), uniform expert reading conditions, avoidance of the experimental in routine reports; a nonpartisan serologist; intralaboratory check by multiple tests (but not too multiple); interlaboratory exchanges of sera periodically for test purposes; laboratory-clinic check, against the opinion and experience of a syphilis clinic."

As the Wassermann work constitutes a large part of the routine work carried out in the laboratories, it might be well to describe what the North Dakota Department of Health is doing to insure correct Wassermann results. As we all know, the Wassermann test, being performed with biological extracts and fluids, can hardly be expected to behave with the same exactness as a purely chemical test. This, in our opinion, is the very reason why no effort should be spared in rendering this test as accurate and reliable as its inherent biological factors will permit. With every step of the test carefully controlled, a high degree of precision can be attained.

It is evident that the Wassermann tests in a public health laboratory should be of the highest accuracy. For a public health laboratory to report a positive Wassermann on one free from syphilis is a very grave error indeed. There again to report a false negative might result in seriously endangering the health of the community. To overcome both of these possibilities this department, as mentioned above, runs two distinct tests on every specimen submitted for examination, namely: the Kolmer Wassermann and the Kahn precipitation tests.

What the state laboratory is doing to render the results of the individual Wassermann tests of the highest accuracy will now be considered. First, of course, is the checking by running two different, distinct tests as was mentioned. Secondly, the laboratory runs a daily

titration on both the complement and amboceptor. The complement is secured from normal healthy guinea pigs every time the test is run, thereby insuring fresh material of high quality. Thirdly, the sheep cells are obtained from our own sheep (previously tested), which makes the resistance of the corpuscles to hemolysis practically constant. Fourthly, the antigen is carefully prepared and checked. The Kahn antigen is standardized in the Kahn laboratory as comparable to their own. The Kolmer antigen is also checked as to titre in at least one reliable outside laboratory before put into use. Fifthly, a daily control system is carried out which gives us a check on the "run."

We feel that our laboratories are giving Wassermann tests of the highest possible accuracy and are constantly striving to perfect the technic by incorporating all new methods in the preparation of reagents, etc. Just recently the laboratory received the following correspondence from the Surgeon General of the U. S. Public Health Service:

"The Committee on evaluation of serodiagnostic tests for syphilis has been completed, a study in which has been demonstrated the ability of laboratories to perform serologic tests for syphilis. The findings indicate that a number of laboratories are able to perform such tests in a way which compares creditably to the performance of the serologists who originated the various procedures. In other laboratories the performance has not been so efficient and, in a few instances, the percentage of false positive reports on known normal specimens has been so high as to result in a most serious condition if the reports of such tests are regarded by physicians in private practice as being reliable. In other laboratories, while no false positive reactions were reported, the sensitivity of the serologic tests is extremely deficient in detecting cases of syphilis so that large numbers of cases of latent syphilis would not be noted in routine practice.

"The Committee has recommended that an opportunity be extended to state laboratories to compare the results of their performance of serologic tests for syphilis with those of well-qualified serologists in other laboratories performing the same tests on comparable samples from known syphilitic and known nonsyphilitic individuals. The Committee also feels that such a system of comparative examination of serologic tests should be extended annually to all State Laboratories. In turn, the State Laboratories should offer a similar service to local laboratories within their jurisdiction.

"The Public Health Service proposes to provide such a system for measuring the efficiency of serologic testing in state laboratories each year. This service will be instituted in the autumn of the present calendar year."

Our laboratories most surely will take advantage of this service, and we expect to have our serological work evaluated, as it will enable us to give the practicing physicians of North Dakota a better, more accurate, and reliable service in this field.

Another phase of the laboratory work which has an important bearing on the health of the public is the bacteriological examination of water. Misinterpretation placed on samples of water submitted for bacteriological examination is quite a problem. While the great majority of samples of water submitted to the laboratories for examination are from private sources, the State Department of Health desires the assistance of county and city health officers in helping to clarify this misunderstanding on the part of the public.

It is a generally-accepted fact that the health of a community depends in a very large measure on the provisions of an abundant and pure water supply. The quality of a water supply affects the health not only of the community which it serves, but all communities connected by travel communication. Water can and does transmit to man illness of very varied character, and the causal agents conveyed by water may be chemical or metallic, bacterial, protozoan, or due to other higher forms of life. The danger to health by the consumption of water arises only in rare instances from the presence of an excess of one or another of the inorganic salts that it may contain, and is comparatively rarely due to metallic matter such as lead, *etc.*, but what vastly more important as far as disease is concerned, is fecal impurity, particularly that of human origin. The danger of polluted water comes not from dead organic matter, but from living organisms. The presence of pathogenic bacteria constitutes the greatest danger with regard to water supplies as outbreaks can be so widespread and destructive.

In the bacteriological analysis of water there are two divisions, the first is the quantitative analysis, which strives to show the actual number of bacteria in a definite quantity of water. More important than this is the qualitative analysis, which is designed to show the presence of a definite group of organisms, which is used as an index of pollution and for that reason is of more consequence than one which merely tells the number present but gives no indication of the potability of the water. Since the organisms found in the *Coli-aerogenes* group are always present in the intestine, their presence in water is an indication that the water is polluted. It would be impractical, if not impossible, to look for the individual disease-producing organism in water, and such information, if obtained, would be available only after a community had been exposed. Therefore, the matter of finding and condemning a supply that is potentially dangerous is far safer and more economical than waiting until the disease can actually be shown to be due to polluted water.

The qualitative examination is made by inoculating fermentation tubes of lactose broth with definite amounts of the water to be tested. These are incubated and examined after a certain period of time. If there is gas production in any of the tubes the organisms present are confirmed on a differential media to determine whether or not they belong to the *Coli*

group. If there is no gas production, we assume that the water is free of *B. coli* and no further work is done with the samples.

One might ask the question, what does the presence of *B. coli* in a water indicate? Briefly, it means that the water in question contains bacteria that are ordinarily present in the intestine and therefore indicate that the water is contaminated with fecal pollution. This may be a permanent condition or it may be a temporary contamination. Such a water is potentially dangerous and should not be used for human consumption as there is the danger that pathogenic organisms may be present. However, a water should never be condemned on the basis of only one examination, as the results may have been due to carelessness in collecting the samples or some other outside factor. The source of contamination should be located if possible, especially where a well water is concerned, as it may be due to faulty construction. It is obvious that a sound judgment in regard to the sanitary quality of a particular water supply should be based on a consideration of the facts brought out by a careful sanitary inspection as well as by analytical data. A sanitary inspection by a competent person is of paramount importance in checking the report of a bacteriological analysis in order to determine the source of contamination. Water reported bad can be rendered safe to use by boiling or by proper chemical treatment.

One might now ask the question, what is the significance of a report where no *B. coli* is found? Such a report simply means that as far as can be determined by a bacteriological analysis, no *B. coli* was found in the sample submitted for examination. Such a report does not necessarily mean that the supply may always remain safe. Here again a sanitary survey is very essential in order to determine whether or not the supply has the proper protection and is insured against some future contamination. The keynote of modern medicine is not cure but prevention. This can well be applied here. We can cure a contaminated water supply so that it will be safe to use, but unless we inspect and locate the source of contamination we cannot prevent future trouble. If a supply of water is safe today, it does not necessarily have to be safe tomorrow unless the construction features are such that it would be impossible for contamination to enter. This especially applies to well water supplies. In other words, we can sum up the whole situation by saying that a bacteriological analysis should be interpreted in the light of a sanitary survey. Proper location, construction and operation is of much more importance for assuring a good water supply than a laboratory examination. If all private wells were properly constructed and located, one could assume with much confidence that the water would remain safe for human consumption.

In such a case, a bacteriological examination can be used as a check on the water supply. On the other hand, an improperly-located or constructed well will always be subject to contamination, and a bacterio-

logical examination in such a case would not have much significance. One sample might be good and another bad, depending upon when it was collected. Naturally, the situation we hope for would be to have all wells properly-constructed, and until this is done we can not expect to have any sense of security as to the water supply.

In conclusion, I might say that the laboratories can

be of great assistance to the physicians in North Dakota. The laboratory knows the desires of the physician and consequently is constantly striving to improve its methods, in order that it may give service of the highest quality. We are ready to assist you and our hope is that you, the physicians of North Dakota, will make use of the Public Health Service as it is now given in our laboratories.

Student Health Practice*

Charles E. Lyght, M. D.†

Madison, Wis.

STUDENT Health service, that began so humbly many years ago as a well intentioned but probably to many a doubtful adjunct of what was then a big-muscle and bath-once-a-week program, has grown until it occupies a prominent place in the educational scheme of most important schools, large or small, on this continent. Now we see the triad of student health, informational hygiene, and physical education working side by side in common effort to protect, preserve and improve the physical and mental welfare of our students.

Pressure from within and without the student health organization is slowly but surely altering its conformation, and it must retain its faculty of flexible adaptability if it is to cope with modern demands, just as its power of stretching itself thin enough during the days of depression enabled it to cover needs no one believed would ever become as broad as they have.

The changing order of things is at once a challenge and an opportunity to student health services everywhere to make friends rather than to lose them. It must never be forgotten that health service work is a vital sector of a united medical front line. Strictly within the ranks of a socially adjustive medical profession is where it belongs, and by a preservation of high standards, by an insistence upon unimpeachable ethics, that is where it will remain. Our brethren practising in other fields of the profession are learning to trust and recognize legitimately conducted student health endeavors, because they identify our efforts as established and moving upon a high plane. Through constant co-operation with family physicians and parents, health services everywhere should be found stimulating confidence and allaying what prejudices may have existed previously. Student Health work, properly conducted, is *not* in any way competitive with organized medicine. It is one important division of organized medicine, performing specialized services for limited

groups with a degree of efficiency not possible through unco-ordinated agencies.

The value to the public and the profession of the information constantly being accumulated by alert student health departments as they perform their primary functions of careful examination and periodic rechecking of the apparently normal toward the discovery of the incipient defect, is incalculable. We are learning that a careful history of functions, of attitudes, of tendencies, is as essential as any number of minute examinations of parts. We are demonstrating in our patients a woeful lack of real, practical, applied health knowledge, and in the course of our duties of examining, and advising, and compiling—not merely statistics, but painstaking records—we are gaining a first-hand acquaintance with those pre-clinical signs of early disease that antedate the text book picture and far precede the symptom. I can visualize "preceptorships," if you will, set up in our departments and designed for medical students, enabling them to learn the technique of pre-clinical diagnosis, just as now they visit the lying-in hospital to be instructed in the art of obstetrics.

We are convincing ourselves as well as our patients of the benefits of properly selected corrective measures, begun at stages that promise results. We are the daily practitioners of all that immunology has to offer. Our efforts in the realm of the early diagnosis and consequently earlier and more certain cure of pulmonary tuberculosis are bearing fruit in the shape of lives preserved, of contacts and infection prevented, of dollars and years saved, of beds made sooner available for other victims, than where formerly, late recognition and uncertain prognosis was the reward of him who discovered cases only because of their symptoms or physical findings.

Time and the depression have served to emphasize the need for expert neuropsychiatric advice for students maladjusted to their environment, or failing before the overwhelming onslaught of abnormal circumstances. The trend is

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†From the Students' Health Service, University of Wisconsin.

toward providing specialists experienced in this branch of medicine, even though the supply still lags far behind the demand. Deans, students, and college health directors are as one in calling for availability of this type of care.

The teaching of college hygiene, if geared for progress, must embrace more of the theoretical at the same time that it takes in more that is practical. Science is marching on. I believe we are finally dispelling the mists instead of deepening the mysteries. We must teach a technique and not merely a text! A speaker I heard recently said that we are now giving people prescriptions for health "with the formula printed on the label." We have passed the "brush-your-teeth" stage and into the "see-your-doctor-early" period. This will be successful, however, only if every doctor is both by training and by attitude ready to be seen by those who are still well and want to stay that way. It will be time wasted if the physician slaps an earnest man on the back, indulges in a tolerant chuckle over his patient's foolishly premature visit, and counsels him to return when he *really* feels sick. If we are planning on giving people "hygiene that's loaded," we must be prepared to take the consequences if some, disillusioned, throw it back at us just before it explodes. We must not allow patients in whom we have laboriously developed an up-to-date preventive consciousness, to revert, as one man puts it, to the negligent state where they are content to drop in at the doctor's office for a friendly chat on the way to the cemetery. A hygiene lecture course without supplementary laboratory work and practical example by a live, coincident college health program, is destined to produce almost as paying results as an appeal for collection during a broadcast church service. The listener *means* to do something about it, but he never quite gets round to doing *anything* about it. We have failed as physicians and as educators if we send out graduates unprepared for modern concepts of the best in medical care, and for co-operation with doctors thinking in like terms.

I can visualize the time not far distant when students will no longer come to our hands as largely unassayed raw material, but rather as the recognizable product of an unbroken chain of expert medical supervision. This chain will have its first link in the prenatal clinic, and will be added to through grade and secondary schools, with the family doctor and the school physician and nurse engaged in an increasingly successful co-operative venture of seeing to it that boys and girls "fit for college" matriculate into our classrooms and our student health services. The impetus for this working backward to first principles must arise in the direction, to those responsible, of the properly expressed dissatisfaction of the college health officer with the all-too-frequent mental and physical wrecks now strewn

through the freshman years. As long as we accept without protest medical risks that would draw roars of pain and indignation from educators in other departments were the physical defeats duplicated by academic lapses in preparation, little will be done about it, and that little will be done slowly. An advanced tuberculosis or a burned-out neurotic at entrance to college will some day be considered no more a credit to home or high school than the "dumb-bell" who fails to hurdle his first mid-semester examinations.

I hold to the view that faculty and employee coverage by our departments should be primarily for the protection of the health of the students, unless facilities are so extensive that both groups can be supervised without slighting either. Examination of food handlers within the college, however, and the diagnosis of communicable disease in the staff are functions not to be side-stepped by us; and, for the protection of the individual and the college, first aid for occupational injuries seems distinctly our duty.

I will not go so far as to say that it is better for a college to have no student health service than to have a poor one, but I do reiterate a warning that no institution is entitled to pretend to a health program it is not prepared to support or equipped to conduct. Funds available will inevitably determine that degree of equipment, physical or professional, with which the work must be carried on, and this will automatically set the boundaries of the student health program. Therefore, the only occasion an apology need be forthcoming is when the load so overtaxes the service that the latter either is forced to operate without the factor of safety work of such gravity demands, or actually breaks down and functions not at all. The student health director who has the chance of choosing between quantity and quality of practice will unhesitatingly and unerringly make the proper choice if assured of the sympathetic support of his college administration. He should surely see his requests for equipment met with the same generosity accorded those of the Chemistry professor. He should no more be asked to examine or treat an impossibly large number of patients, than would his confrere in English be required to teach groups unwieldy beyond his powers or their welfare. Re-adjustment to accommodate temporary stresses is legitimate, and must be done gracefully, but working indefinitely at serious disadvantage is a short-sighted policy not supportable in the light of the health at stake.

In these days when so much of early diagnosis depends upon the clinical laboratory, its findings intelligently evaluated, there is no excuse for attempting to practice without the best laboratory facilities our budgets will permit. Otherwise we are deluding and handicapping ourselves and working a hardship on those we must protect,

just as the man who, because he was brought up on the stethoscope, still stubbornly exalts it above the Mantoux test, the X-ray film, and the fluoroscope as the detectors of tuberculosis in its earliest recognizable forms.

It seems definitely necessary for colleges to provide infirmary facilities or arrange for equivalent hospital care if early diagnosis is to be followed by prompt treatment at reasonable expense, and if the well are to be protected by immediate segregation of those suffering from communicable disease.

Where, in small college communities, hospital facilities are totally lacking or unfortunately meager, the college may well decide to take the initiative in campaigning for an adequate hospital. With the support of town, gown and physicians, a structure and a service may be achieved quite impossible of attainment through divided effort. In such a set-up, the modernly conscious local physician and surgeon will be found working shoulder to shoulder with the college health officer, and instead of any possibility of jealousy or misunderstanding separating them, co-operation and friendship will dovetail and cement their mutual responsibilities, with profit to all concerned.

No student, in my opinion, should be asked to contribute funds toward the erection of permanent student health clinic or infirmary facilities, or their equipment with basic necessities, unless that portion of his health fee is kept optional. He should be expected to pay only that fairly proportionate sum that will guarantee *him* reasonable protection and intelligent health supervision during *his* stay intramurally, plus a small additional fraction to insure against unpredictable epidemics. The college, in the light of accumulated experience and present sociologic and economic standards, owes those within its walls establishment of fundamental student health services with all the certainty that it is expected to provide classrooms, laboratories, heat and light, or a playing field and gymnasium.

Where colleges find their resources unequal to financing what they have learned would be generally considered an adequate modern program of preventive medical supervision of their students, they should not flinch away from the problem under the possible misapprehension that these students will rebel against an assessment sufficient to guarantee it. The solution would seem to lie both in securing basic funds from budget

sources, and then in enlisting *voluntary* co-operation of the students, who, in my experience, are eager to assure themselves of readily available, high class medical coverage at a fee commensurate with the modest sums most must rely upon for the needs of a school year. Parents, too, will generally be found heartily endorsing any plan that provides competent, uniform medical advice, and supervision up to a reasonable point, for young people temporarily denied the home and the family physician's personal care. Too many schools are marking time on the student health front because they hesitate to increase the health fee to a workable level, even though the per capita levy would not be significantly raised compared with the extra protection assured each individual. They fear to cause even a mild dislocation of the total fees, lest next year's paying guests be frightened away, when, actually, new students would be attracted to colleges known to possess up-to-the-minute facilities for the prevention or early recognition of disease, and for its immediate care, if found. Crippling expanse developing out of accident or illness may not infrequently interrupt or demolish a college career, where a dollar or two added to the health fee would obviate such a disaster, and provide the same or better services.

Finally, I must say that I believe every institution of higher learning, always depending on local conditions for the outline its program must assume, should arrange for at least part-time well trained medical supervision of its students. A nurse is *not* sufficient! No nurse should be expected or required by any school to perform functions a physician would forbid were he present. Frankly, such undue delegation of responsibility is not only dangerous, it is illegal. The essence of prevention, we teach over and over, is in early consultation of the physicians by the patient. Availability of service is admittedly what makes such a plan operate. Early consultation, however, inevitably slackens off in the face of restricted or haphazard or prohibitively expensive contact with physicians trained to think in the terms I have outlined. But before any student health program is ready for its launching, it should be recalled by college administrators that it is still true in this field as in all others that "the laborer is worthy of his hire." Student health personnel, performing vast services of high importance, serving and protecting student, parent, college, community and nation, should be properly paid.

An Address*

By

Elliott P. Joslin, M. D.,

Boston, Mass.

CHAIRMAN Hopkins, Ladies and Gentlemen, Members of the inter-Allied Groups: I am very happy indeed to be here. I never have been in this part of the country before, and was much interested in it and still more in the people who live here. I approve of this idea and believe strongly in it. I am to finish in 15 minutes, less time than put down for me, out of regard to those gentlemen I want to hear.

It is pleasing that the dentists are in this group, because they are very important factors in the treatment of diabetes. Each patient I have who enters the George F. Baker Clinic is examined by a dentist. I know an infection makes the diabetic worse; therefore while in the hospital each patient must have his teeth examined so the source of trouble can be removed. We do it wholesale. The patients do not have so much money. Each patient is examined by a dental hygienist who looks the patient over. If in doubt, the patient will have an X-ray of the teeth. The patients get free examination. At first I subsidized it from other people—\$1500 to \$1800 a year. Now the Dental Department takes care of itself.

If it does not seem there is need for a dentist to look over them, he does not do so. If the patients need to have their teeth cleaned, it is done for nothing if they are unable to pay for it; but two or three dollars—whatever the regular amount—is charged those able to pay. The only dental work we do in the hospital is the cleaning and extracting of teeth. Poor people get their teeth extracted for nothing, generally right in the hospital. Between 600 and 700 teeth are extracted for my diabetic patients each year. That is done wholesale so that we can have it done well.

Dr. Minor, Dean of the Harvard Dental School, and Dr. Kent are on the staff. If there is a question of anesthesia, the dental hygienist looks it up. A dentist sees the patient and extracts the teeth, but never sees him again, because the hygienist takes care of him afterward. By doing wholesale work and working with the dentists we are able to get expert care for the poor, and those in moderate circumstances, and those well-to-do. The scheme works so well it is "off the boards." It pays for itself.

There is a group which is not in this assembly. I refer to the chiropodists? They are a great help to us. Perhaps foot trouble does not exist to a great extent in South Dakota. You do not have as many old people to get corns and callouses, so you do not need the chiropodists. Just wait. Everyone is growing older, and by and by the South Dakota folks will get old enough to need the chiropodist, too. These organizations provide for diabetic feet, and keep them in good condition.

*Read before the South Dakota State Medical Association meeting held at Sioux Falls, S. D., May 4—6, 1936.

We do not take care of their faces. That's up to them. Mr. Shearer gave me the money to organize the foot parlor, and it now takes care of itself. That is the fundamental need in the United States today—to start things strong enough to support themselves when started.

In addition to the dentists and chiropodists, we have our nurses. They are indispensable in the treatment of diabetics. In the hospital we use the nurses to teach the patients. We have a nurse in the hospital who teaches each individual patient either in her office or at the patient's bedside. Besides that, she teaches all the nurses diabetic nursing. We depend on nurses especially, rather than dietitians, although last year we had two dietitians. They really were very useful. We depend chiefly upon the nurses because we must have the patients taught a proper diet. That is only a minor thing. We teach them to avoid coma and avoid gangrene, and adjust themselves to the various exigencies which come up in their lives. Nurses belong with any diabetic group.

We have a wandering diabetic nurse. That idea appealed to one of my friends. He gave me a thousand dollars toward her support. She is most useful. She goes to the homes of our children. We have over one thousand children—about 900 scattered about the country. She may take a circuit through Maine, New Hampshire, and Vermont. Once this wandering diabetic nurse was given an assignment to see 21 families. She lived two days with each family. We wrote in advance to the doctor of the patient she was going to see. Under the sponsorship of the association, she helped that family in the care of the diabetic child.

Of the 21 homes, one paid her something as a salary, and one paid her fare from the previous city to the next city. We think she was very helpful.

We have changed a bit on that. This wandering diabetic nurse now goes to the older patients—65 years of age and upward. When they go home after operation or treatment for gangrene or infection, she goes into their homes and visits them and sees they are getting along alright with their artificial legs. She is a tremendous asset.

I was caught once with a child in a well-to-do family, and no one but the wandering nurse to go there. They sent me a thousand dollars, and have paid for a wandering diabetic nurse ever since. That's what she will do for the people.

As to the hospital administrators, you are here. I have something to say about them. The ordinary patient can pay his board the first week in a hospital. Some can pay the second week, if a small amount. After that they are in trouble, and the hospitals are able to collect bills that doctors never would collect. The hospitals collect bills better than the doctors because they are im-

personal institutions. What is the point about that? It is this: Our children cost upwards of \$30 a week. We can take care of but a few in the hospital. Dr. Priscilla White will have 170 diabetic children in camps at \$10 a week. That's the way we have solved the children's hospitalization problem.

At the Prendergrast Preventarium, with the contacts who do not have tuberculosis but might get it, they took 30 or 40 children last summer, and had 75 this summer. This winter we had a lot of poor diabetic children, and we went to the State of Massachusetts, to the Board of Health and Welfare Boards of the towns. We picked up our poor diabetics and took them to the Prendergrast Preventarium. We had a dozen children—practically a diabetic boarding school. When one of these children developed pneumonia, we took it to the hospital.

One more word. The laboratories and technicians are in the hospital. We believe in the intimate relation of the laboratory with the patients and doctors. We can get laboratory work for nothing, if necessary, to a certain extent. The doctors can not do it in private practice. The State Commission appointed to revise our health laws—such men as Green, Minot, and Osgood—and in association with such authorities we formulated a plan for various chronic diseases. We felt there should be in perhaps ten or twelve places in Massachusetts arrangements by which the hospital could be subsidized, so that a doctor could get blood sugar tests at a reasonable rate. In this hospital they should have a wandering diabetic nurse who not only teaches diabetic nursing in the hospital, but who can be called upon to help the doctor in his office. We have 15,000 diabetics in Massachusetts. I think ten nurses would handle the wandering diabetic nurse situation pretty well. That would mean 1500 diabetics to one nurse. Many of them would not need training.

The advantage of having certain centers where a doctor has a chance to get health work if he needs it, where he can get a nurse to teach his diabetics when he does not have time, and a hospital where this unit is organized, so that if you have a case of diabetic coma you can send the patient to the hospital and get up-to-date attention and tests within an hour of admission, is obvious.

In one hospital in New York City they locked the laboratory Saturday and opened it Monday morning. That time is past. In obstetrics you do not say "No one shall have a baby from Saturday night until Monday morning," so you can not tell a diabetic, "You can't get into trouble for the same period." The technicians have found out they are no better than the doctors who must see a woman in labor. Any technician, I am sure, if it is presented to her properly, will be glad to work day or night and save the life of a diabetic patient who goes into coma.

Now as to the doctors, I have 300 who are diabetics. There are about 100 of them dead. My diabetic doctors last year lived on the average 11 years. I talked in Pennsylvania, and next week I had a doctor from Pennsylvania, 75 years old. He said, "I heard you say

your diabetic doctors lived 11 years, and I have come for treatment."

I will tell you something new and striking. The last 931 of my diabetics who died preceding a year ago, died at the average age of 63 and doctors die at this same age. We have recently looked at my diabetic doctors again. The last 32 who have died were 68 years old. How many had coma? We know children can be gotten out of coma. One-half of them may get it. If they have good cooperative treatment of nurses, technicians, hospital administration officials, and doctors, they will get out of coma. With old people that isn't so easy. Upwards of 30 per cent may die. Of coma cases, 10 per cent may die. Just one of my doctors died of diabetic coma. If the doctors won't die of coma, the patients may take for granted death from diabetic coma is unnecessary, and ask the doctors to do as well by them.

I spoke this morning at the session on the increase in diabetics. Diabetes has gone up tremendously because, in the first place, the people are older. I told the group this morning that in Boston in 1840 about 80 per cent died under 40 years of age. This last year 80 per cent in Massachusetts died over that age. We may not have all kinds of subsidies for farmers, but we are raising up a crop of old people so that when they get their old-age pensions we can get the benefit of them. In the first place, there are twice as many diabetics over as under 40. In the second place, it is the duty of every diabetic to examine the urine of all the members of his family and see if they have sugar; if so, send them to a doctor.

Once I had a diabetic come to my office and we taught her to do the Benedict test. She had a boarding house. She tested the urine of all her boarders and found a diabetic boy. That patient eventually came to me. I asked him how he found out he had diabetes, and he told me. Eleven days after she went home she contracted pneumonia and died, at the age of 79. If a woman of that age, with one visit to a doctor, will do the urine of everybody in the boarding house and find the one who has diabetes, certainly anyone ought to be willing to test the urine of his relatives. That's the way to detect it. The disease is hereditary. Of diabetic patients between 50 and 60, practically 99 out of 100 are fat.

How can a doctor retain his diabetic patient? When a patient comes to a doctor, the doctor must tell that patient more than the patient has read in newspapers. The doctor must read his medical journals. Diabetics pick up a lot of information in the newspapers, and it is good. No doctor can keep his patient unless he knows more than is in the newspapers, and each time the patient comes, the doctor can tell him something that is beneficial. One can not treat diabetics by giving prescriptions. It is plain hard work and time and patience. It is a great thing for doctors to keep them alive. Formerly the patients lived a short time; now they live a long time. We can safely say any diabetic going to a doctor in the early stage of his disease will certainly have an expectancy of 20 years. A child coming down

with diabetes will have an expectancy of 30 years. These figures have been worked out by the Metropolitan Life Insurance Co.

This morning I talked to a group of 23 diabetics. Up to 1914, my diabetics lived 4.8 years. In 1922, that figure crept to six years. The group this morning had been diabetic over six years. This group before 1922 would have been dead. Now they are alive. When a diabetic comes to the office of a doctor, if the diabetic is young, the chances are he will bury the doctor. Doctors only practice on the average about 30 years. Diabetes is such a good disease for the doctors because the quacks do not get a show at it as they did years ago—thanks to F. M. Allen. He emphasized the importance of examining the urine for sugar. If the patient who has diabetes takes a patent remedy and sees the red test, he knows the medicine isn't doing him any good.

Last year we made a survey of diabetes in Boston. Dr. Lynch, just out of medical school, said he would do it. We only had \$500.00. I told him I felt each diabetic in Boston should be investigated. They could not do that in New York City. We had 301 diabetics in Boston last year. There were twice as many females as males. Women over 40 must not get fat. Of this number, 80 per cent were married. The reason married women have diabetes more than single is because they weigh 20 pounds more than single women. I think it is not due to the men but to the pounds.

This is the only consoling thought from that record: No diabetic in Boston died last year under 19 years of age. We found 41 cases of coma. Of the total of 301, 165 died in hospitals. In eight hospitals, 141 died. We doctors got together and got a surgeon there. Dr. Lynch picked out 36 he considered had the least cause for dying. We passed their case histories around and each doctor read four cases to the others. We decided we hospital doctors had better treat all comas more promptly, and look after our surgical patients. Then we can go to the laity. In the hospitals there were only 21 autopsies.

Some one asked me to say something about the management of pregnancies. Any diabetic woman who becomes pregnant needs careful watching—at least twice the ordinary care. For the last month of the pregnancy every case, but certainly primiparae, should be in the hospital because these cases change in a moment. One of my nice diabetic girls in Brooklyn married the son of a doctor. She walked into her father-in-law's office in an uremic convulsion, and lost the baby. This year I have seen a diabetic woman pregnant who had lost her first baby. She came to the doctor to save her baby. Her blood pressure was 120 until it registered 160 one night at five o'clock. We had a caesarian section at six o'clock.

We have an elaborate, up-to-date arrangement for keeping them warm. We have oxygen and carbon dioxide for stimulating respiration. We have an aspiration apparatus. Why do they die? For various reasons,

such as delay in performing the caesarian, asphyxia, and they may die with hypoglycemia. Several times Dr. White has given glucose subcutaneously with good results. All babies when first born have low blood sugars. That may not be the whole reason.

As to state medicine in diabetics, I think this disease can not be put in with state medicine except as I have indicated by educating the doctors. Diabetes is a personal disease. It is peculiarly a disease for a good doctor. He knows about the family and the hereditary influences and can detect the new cases and warn against obesity and all that. The diabetic must have confidence in his doctor who can follow through the diabetic's life. In this day of chronic disease, upon investigation, we found the diabetics were the ones who had doctors. Only a small proportion of the rheumatic patients had doctors they cared for. Cancer and heart disease were down in the list.

There are 500,000 diabetics in the country. We may expect 3,000,000 will develop diabetes before they die. We must get across to the diabetic patient that he carries the welfare of the other 499,999 each day. If he lives correctly, he helps another diabetic. If he is careless, he injures all the diabetics. One of my boys was arrested for drunken driving. He wasn't drunk. He had an insulin reaction. The police doctor wanted to know if the "Old Doctor"—meaning me—was there. I don't like that term. He said, "I never saw an insulin reaction like that." If two other diabetics had a similar accident while driving, it wouldn't be long before the police would say. "No diabetic should run an automobile."

I am glad to say diabetics are bright. One of my diabetics was among the first six in his class at Harvard. Their children will not transmit the disease if they marry non-diabetics in non-diabetic families.

I like to have my diabetics look well. My next to the last coma case would come along, all painted up. Never discourage a diabetic from looking well. We want them to be independent and self-supporting.

Protamine insulin is wonderful. I have treated more than 900 cases with it. The variety used most has been the protamine zinc insulin, which I hope will go on the market soon.

We have been under the spell of the old insulin. With the old insulin, diabetic coma dropped almost to the vanishing point. But protamine insulin shows new experiments can be done with it. We think the diabetic patient can be put back more nearly to a physiological status. It is the fact we have a fresh outlook which is of most value in the discovery of protamine insulin. We ought to give the name of the era to the one who made this new outlook possible—Dr. Hagedorn, of Copenhagen.

Urticaria*

Carl W. Laymon, M. D., Ph. D.
Minneapolis

URTICARIA, though easily diagnosed, often presents a most perplexing problem in finding the etiologic agent, and since successful therapy usually depends largely upon removal of the cause, its discovery should be the chief goal in every case. The purpose of this discussion is to analyze and summarize the reports of various workers who have studied large series of cases, in order to form a systematic method of investigating the condition. When a patient with urticaria presents himself for advice it is not sufficient to prescribe an antipruritic lotion, adrenalin or calcium. If any degree of success is to be attained, a painstaking history must be taken with special attention to details which may on the surface seem irrelevant.

According to Coca,¹ the primary urticarial lesion (wheal) may be either allergic or non-allergic in nature. Allergic urticaria, in turn, may be atopic (reaginic) or non-atopic (non-reaginic), depending upon the demonstration of anti-bodies in the serum of the affected patient and the co-existence of other atopic manifestations such as asthma or hay fever. Taub and White² classified urticarias in essentially the same way into two distinct groups:

I. Urticarias associated with mucous membrane lesions such as hay fever and asthma (atopic). In this group, usually caused by foods, passive transfers are positive and the lesions can be reproduced by ingestion or rectal administration of the offending excitant.

II. Urticarias without coincident mucous membrane affection, usually due to drugs, serum, various intoxications and, according to Taub and White, foods only rarely (this includes both the non-allergic and non-reaginic urticaria of Coca's classification). Localized urticaria is usually of the contact type, the lesions being caused by the direct effect of irritants which come in contact or are injected into the skin, such as nettles, caterpillars, insect bites or stings, certain plants, wool, etc.

Causes of Generalized Urticaria

1. Foods: Hopkins and Kesten³ believed foods to be the most common cause of acute urticaria but only occasionally a factor in the chronic form. As Taub and White brought out, urticaria due to foods may be either atopic or non-atopic, the acute types such as those caused by uncommon foods (strawberries, shell-fish, etc.) being non-atopic as a rule. In certain cases food is an important but not the only factor. Eichenlaub,⁴ in a series of 58 cases of urticaria, be-

lieved food to be the chief but not always the sole cause in 20 cases. In the series of 100 cases analyzed by Stokes, Kulchar and Pillsbury,⁵ food intolerances were usually found associated with other causes. Fink and Gay⁶ studied 170 cases of urticaria, of which 20 per cent were considered allergic (not necessarily atopic). Seventy-five per cent of these patients were cured by avoiding the specific allergens to which they were sensitive (chiefly foods but also inhalants). In discussing this paper, Vanderveer expressed the opinion that milk, chocolate, and shell-fish were common offenders. Rowe⁷ believed that food allergy should be considered in all cases of angioneurotic edema and cited 14 examples which were controlled by elimination diets, one or more foods being the causative factor.

Urticaria due to food usually appears within an hour or two following ingestion. In some instances the quantitative factor enters in and the lesions may appear only after excessive amounts have been eaten and several days have elapsed. The quantitative element in such cases is comparable to that in urticaria following the injection of serum.

In non-atopic urticaria due to foods, skin tests are of no value. Rowe,⁷ in studying a group of 20 patients with urticaria, found that skin tests were entirely negative in 35 per cent. The skin of certain patients is so dermatographic that the slightest trauma causes wheal formation, making testing impossible. Elimination diets in urticaria due to foods offer a much greater chance of success than cutaneous tests.

2. Drugs: Within recent years medications have been mentioned as one of the chief causes of urticaria. In discussing the paper by Fink and Gay;⁶ Vanderveer, Rackemann, Cohen, and Sulzberger all emphasized the etiologic importance of drugs. Of 58 cases which he studied, however, Eichenlaub⁴ found drugs to be the chief cause in only two instances. Almost any compound may give rise to urticaria, although quinine, aspirin, allonal and luminal are among the most important. Urticaria is one of the prominent symptoms of serum disease.

3. Infections: The association of urticaria with various bacterial and mycotic infections is occasionally observed and there have been numerous reports of cases due to infected teeth, tonsils, sinuses and gall bladders. Fink and Gay⁸ believed that 30 per cent of their 170 cases were traceable to foci of infection. Seventy-four per cent were completely cured by appropriate therapy. Menagh⁸ felt that biliary tract infection was the chief cause in 48.8 per cent of 260 cases

* From the Division of Dermatology, University of Minnesota, and the Dermatology Service, General Hospital.

of urticaria which he studied, and at least a contributory factor in an added 11.2 per cent. With this in view, 45.2 per cent of the patients were completely relieved and 38.6 improved, leaving 16.3 per cent who obtained no benefit from treatment. Eichenlaub⁴ thought that foci of infection constituted the chief cause in 14 of 58 cases which he observed. Among the infections were colitis, pyelitis, and breast abscess. Cohen expressed the opinion that the intestines may harbor a focus of infection and that relief from urticaria may be obtained by autogenous vaccines prepared from the intestinal bacteria in these cases, combined with changing the flora with sodium ricinoleate and acidopholus therapy.

4. Constitutional (Metabolic) Factors: Among the various constitutional causes which have been associated with urticaria are constipation, endocrine disorders, renal disease, and gout. Eichenlaub⁴ stated that constipation was the most common contributing cause for the condition in 58 cases which he studied. Among other causes which he found were pregnancy in two cases, cirrhosis of the liver (one), nephritis (one), and malaria (one). Hopkins and Kesten,³ however, attached little significance to constipation in urticaria, since it is a so common and immeasurable complaint.

Criep and Wechsler⁹ and later Criep¹⁰ thoroughly studied 40 cases of urticaria as to the relationship of gastro-intestinal changes, thyroid function, the acid-base balance and blood chemistry. They concluded that changes in gastro-intestinal and thyroid function were for the most part co-existent with, contributory to, or as a result of the urticarial state. The lack of specificity of such changes led to the belief that there was no direct relationship. They mentioned the division of opinion as to whether urticaria was associated with acidosis or alkalosis but could find no significant changes in the CO₂ combining power of the blood in any instance. The blood sugar, non-protein nitrogen and urea values were consistently normal. No abnormal deviations in blood calcium were discovered, though they felt that calcium therapy was of some value in allergic disorders due to its effect on the nervous system. Ramirez¹¹ also studied the value of calcium in 50 cases of hay fever and was unable to find calcium deficiency in any case or note any instance where calcium therapy was of any permanent value. Temporary improvement, however, was noted in some patients. He cited the work of Criep and McElroy¹² which substantiated his findings and that of Sterling,¹³ Brown and Hunter¹⁴ and others which disagreed with his opinion.

Fink and Gay⁶ classified only 5 per cent of 170 cases as endocrine in origin, including disorders of menstruation, pregnancy, the menopause, and hyperthyroidism.

5. Inhalants: Urticaria due to pollens or other inhalants may or may not be associated with atopic conditions such as hay fever or asthma.

For example, Taub and White² observed a patient who had urticaria on the legs every summer from June 15 until fall. Although there was no associated hay fever, skin tests to grass pollens were positive. The avoidance of tennis courts, golf links, etc., relieved the condition.

Sternberg,¹⁵ on the other hand, reported a case of urticaria associated with hay fever. Cutaneous tests with ragweed extract were positive and both conditions were relieved by appropriate pre-seasonal treatment. At the time of the report Sternberg was unable to find a similar case in the literature.

6. Intestinal Parasites: *Ascaris*, hookworm, echinococcus or other intestinal parasites are more frequent etiologic factors in chronic than acute urticaria. M. Walzer¹⁶ mentioned that reagins could sometimes be found in the blood of these patients (passive transfers positive). The study of patients with chronic urticaria should always include examination of the stools.

7. Cutaneous Manifestations of Physical Allergy: The term physical allergy ("altered reaction to physical agents") was applied by Duke^{17, 18, 19} to such allergic manifestations as urticaria, asthma, coryza, and weakness which are brought about by mechanical irritation, heat, cold, or light. The resulting reactions may in general be immediate or delayed and localized or generalized. Patients, as a rule, react to only one of the physical agents.

The exact causes of the specific reactions to physical agents are as yet unknown. Bray²⁰ felt that each type probably has a specific chemical basis and mentioned that the skin may be sensitized to light by the intravenous injection of hematoporphyrin and that the effect of cold allergy can be produced by histamine.

The same general principles of therapy apply in cases of physical allergy as in other allergic disorders: avoidance of primary causes, treatment of associated illnesses, symptomatic measures, and finally specific therapy with the causative agents, such as heat, cold, etc., as the case may be. In all, however, exposure to the cause with small initial but gradually increasing dosage is the basic principle just as in other allergic diseases. Alexander²¹ cited the work of McKenzie and Baldwin, who showed that the ability of the skin to produce an allergic reaction became exhausted after repeated injections of the allergen at the test site. Duke¹⁸ stated that therapeutic measures were reasonably successful in a majority of cases and brilliant in selected cases.

8. Psychogenous Factors: In a recent detailed article, Stokes, Kulchar and Pillsbury⁵ reported the results of their studies in 100 cases of urticaria with special reference to psychogen-

ous factors. They found abnormal psychoneurogenous elements in the background of 83 per cent of their cases as compared to 24 per cent in a control series of acne, psoriasis and impetigo. However, these factors, principal of which were the tension make-up, neuroticism, the worry habit, shocks, family troubles and finance, appeared in a great majority of the cases in combination with other possible causes such as food intolerances, foci of infection, etc. In only 12 per cent was the psychoneurogenous factor the sole recognized cause. The authors believed that urticaria was a disease of complex rather than single causation.

Sulzberger, in discussion of the paper of Fink and Gay,⁶ expressed the opinion that to classify a case of urticaria as psychogenous was the "emblem of allergic defeat."

Papular Urticaria and Prurigo Mitis

The relationship of papular urticaria and prurigo mitis to allergy was recently studied by A. Walzer and Grolnick.²²

The term papular urticaria was first used in 1860 by Hebra, though Willan in 1798 had described and named the same condition strophulus. Bateman, a pupil of Willan, thoroughly described the disease under the name lichen urticatus. Many other appellations have since been used.

French dermatologists led by Bazin, considered papular urticaria a mild type of prurigo and classed the two entities together, whereas the German school at the time of Hebra thought of the condition as a variety of ordinary urticaria. The English were divided in their opinions. The Americans, until the past few years, supported the German view. More recently there has been a tendency to class papular urticaria and prurigo together.

The original prurigo which Hebra separated from a number of itching dermatoses in 1860 was regarded as an extremely chronic, incurable, pruriginous, papular dermatitis. Kaposi later described a milder type (prurigo mitis) which was considered curable. The latter type is that which was included in the study of Walzer and Grolnick.

The differential diagnosis between papular urticaria and prurigo mitis cannot be made until the characteristic prurigo papule appears, as both conditions begin the same.

The following table illustrates the differences in the two conditions:

PAPULAR URTICARIA	PRURIGO MITIS
Onset: First year of life.	First year of life.
Lesions: Papules, wheals.	Uniform, pale, conical papules.
Secondary Changes: Slight.	Many. Lichenification, infection, excoriations, scars.
Distribution: Evenly on the extremities.	More intense on forearms and thighs.

Constitutional Symptoms: Negative.	May be anemia, nervousness, malnutrition.
Duration: Shorter than prurigo.	Persists usually till puberty.

Walzer and Grolnick believed that the histories of their patients suggested an atopic basis for both disorders even though it has not been determined beyond doubt that they are manifestations of hypersensitiveness.

Specific therapy based on the tests was of no avail. Likewise non specific measures, such as removal of foci of infection, physiotherapy, and elimination of skin irritation produced no improvement. The authors concluded that papular urticaria and prurigo mitis were probably atopic but not medicated by the same mechanism as other manifestations such as asthma, hay fever and atopic dermatitis. Skin testing was apparently of no value either in diagnosis or treatment. Every indication pointed to the fact that the cutaneous reactions in each instance and especially in the asthmatics were linked to the other atopic manifestations of the patient rather than to the cutaneous condition.

Comment

From a survey of the reports of various men who have studied the condition and from personal experience at the University and Minneapolis General Hospitals, the impression is gained that urticaria is frequently refractory to all types of therapy unless the etiology is immediately obvious as in the case of acute urticarias due to foods. In many instances, despite careful and painstaking history taking and skin testing when indicated it is impossible to determine the etiologic factors and is necessary to resort to symptomatic therapy. Urticaria due to physical agents seems to offer no better prognosis than cases due to other causes. The multiplicity of etiologic agents in many cases undoubtedly increases the difficulty in obtaining uniformly good response to treatment. In various accounts in which the therapeutic results have been published there were approximately 40-60 per cent of patients cured, 25-50 per cent improved, and 6 to 16 per cent failures. (Eichenlaub, Menagh, Fink and Gay, Stokes, et al, etc.). In short, though careful study will prove successful or at least yield improvement in most cases of urticaria, there are certain ones which defy all analysis in which the results are poor.

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Pneumonia Typing and Specific Treatment*

Bernard A. Cohen, M. D.**

Minneapolis, Minnesota

WITH the advent of specific type antipneumococcic serum on the market for types I, II, V, VII, and VIII, the specific type determination of patients with pneumonia is becoming daily more important. While 32 types (Cooper)^{1 & 1'} of pneumococci have thus far been isolated, at present for practical purposes, it is felt that patients should at least be typed to correspond to the therapeutic sera available.

At the Deaconess Hospital during the year 1935-1936 we have endeavored to handle this problem purely from a practical standpoint. Cases have been typed by the capsular swelling method of Neufeld and the agglutination method of Sabin (Bullowa).² If a type was obtained for which serum was available, specific type treatment was instituted. Those cases for which no serum was available were given the usual symptomatic treatment.

We should like to present our experience with a small group of 48 cases. This series might well be representative of the typed cases seen during a year at the average private hospital. Of this group 42 were typed from the sputum while 6 patients, unable to raise sputum, were typed from material obtained by gastric aspiration. (Wittes, Bullowa)³. On part of each specimen obtained the rapid direct Neufeld method of typing was done for types I, II, III, V, VII and VIII. The remainder of the specimen was injected into the peritoneal cavity of a white mouse, and the typing was checked by the Sabin method. If no Neufeld reaction was obtained for the above mentioned types, we relied solely on the Sabin method for type determination. The Sabin method was used for types I thru 32. The peritoneal fluid from the mouse taken 3-10 hours after injection of the specimen to be typed was in each case subjected to the bile solubility test.

Our results of typing and comparison of methods of treatment are shown by the charts. Chart No. 1 shows

the number of cases in the various types encountered. Chart No. 2 shows the type distribution and mortality rate in those cases treated without serum. Chart No. 3 shows the type distribution and mortality rate in the serum treated group. The 6 cases of type V indicated on chart No. 2 were admitted to the hospital before type V therapeutic serum was released on the market. This fact enabled us to compare specific and non-specific treatment in one particular type. The difference in mortality is indicated by the charts.

In those cases treated with serum our object has been to give as much serum as possible, in the shortest period of time, and as early in the disease as possible. In all cases the first dose was 10,000 units. This was followed in one hour by 20,000 units. This later dose was repeated every 2-3 hours. All serum was given intravenously following the ophthalmic and skin tests for serum sensitivity. The amount given varied from 50,000 units to 230,000 units and depended solely on the condition of the patient. In those cases where treatment was instituted early in the disease the response was more rapid, and the amount of serum used was less than in those cases treated later in the course of the illness. Our fatal case of type VII was a chronic alcoholic who was first treated on the second day of his disease, and who had been under the influence of liquor for three days prior to admission. He received 110,000 units of serum.

Comment:—This presentation is not offered as a statistical study; we feel rather that our experience in handling this problem from a purely practical standpoint is worth mentioning. Although our small series might not permit us to draw definite conclusions, we have been impressed with the importance of specific type determination and treatment of this common and extremely serious disease. From our charts the mortality rate in the serum treated group is 4.76%. (Bullowa)⁴ in a series of cases of the same types treated without serum reports an average mortality rate of 23.6%. Of his series of type V cases he says, "Throughout the seven

*Read before the Hennepin County Medical Society, December 2, 1936.

**From the Department of Pathology, Deaconess Hospital.

years of our work the mortality from our type V pneumonias has been 21%. Of cases treated during the last four years the mortality was 5%."

(Correspondence with the author).

Type	Cases	Type	Cases
I	7	VIII	3
II	3	XI	1
III	6	XXI	1
IV	4	II & V	1
V	10	XXXI & XXXII	1
VI	2	XXX	1
VII	6	Strep	1
		Agt in all groups	1
		Total	48

Chart 1. Type Distribution of All Cases.

Type	Cases	Deaths	Mortality Rate
III	6	3	50%
IV	4	0	0
V	6	3	50%
VI	2	0	0
VIII	2	0	0
XI	1	0	0
XXI	1	1	100%
XXX	1	1	100%
II & V	1	0	0
XXXI & XXXII	1	1	100%
Strep	1	1	100%
Agt in all groups	1	0	0
	27	10	37%

Chart 2. Mortality in Non-Serum Treated Group.

Type	Cases	Deaths	Mortality Rate
I	7	0	0
II	3	0	0
V	4	0	0
VII	6	1	16.6%
VIII	1	0	0
	21	1	4.76%

Chart 3. Mortality in Serum Treated Group.

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Tuberculous Infection and Progressive Tuberculous Lesions

Resulting From An Open Case of Tuberculosis

R. H. Stiehm, M. D.*

Madison, Wisconsin

THE opportunity to study tuberculosis infection in a group of individuals before and after contact with an open case of pulmonary tuberculosis rarely presents itself.

This report concerns a girl in her senior year of college, who lived in a sorority house with eighteen other girls. During the course of three months (December, 1934 through February, 1935) before consulting a physician, she had noted a persistent cough. On examination she was found to be suffering from far advanced pulmonary tuberculosis and her sputum contained many tubercle bacilli.

Since all newly enrolled students, beginning with the fall class of 1933, have received the tuberculin test, the opportunity was presented to observe formerly-known negatives. At the first test either 0.1 mg. of Old Tuberculin Saranac Laboratory or 0.0002 mg. of the Purified Protein Derivative of Seibert and Long is given. If at the end of 48 hours no reaction has occurred, the procedure is repeated, using 1 mg. O. T. or 0.005 mg. of the P. P. D.

*From the Department of Student Health, University of Wisconsin.

On checking records, it was found that of the 15 girls who reported for the tuberculin test, 11 had formerly been negative. Eight had been tested in the fall of 1933 and two in the fall of 1934. One received a test in high school in 1932, which was reported negative. Of the 11 known to have been negative, all or 100 per cent showed a positive reaction in March, 1935. Of the four having no previous test, three or 75 per cent were positive. The one individual showing a negative test stated that she had lived in the house for only two weeks, and this short contact probably explains her escape from infection. Of the 15 tested, 14 or 93.3 per cent showed a positive reaction. This compares with a percentage of approximately 25 per cent in the entire student body.

That an open case of pulmonary tuberculosis is highly infectious to other members of a household seems to be clearly demonstrated by this study.

Apropos to the above, it is of interest to note subsequent developments as concerns tuberculosis in this group of girls.

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THE JOURNAL-LANCET AND 1936

THE JOURNAL-LANCET embarks upon the New Year with a re-endorsement of the policies which have made for its present status. The standards of the papers presented through this JOURNAL have been of high excellence as demonstrated by the numerous abstracts, reviews, and quotations which have appeared in other first-class medical publications. In this fact the Editorial Board takes considerable pride, since its members have exercised much care in the selection of articles, as well as the requests that have been made for special articles. The demand on the part of authors for publication in THE JOURNAL-LANCET has so increased that we now have more unpublished articles of medical import on hand than has been recorded in the sixty-seven years of the JOURNAL's history.

THE JOURNAL-LANCET is not in competition with any other medical journal. In fact, its policy has been to retain the field in which it has served so long and to fill any other niches which are not being filled by other medical journals. A few years ago it broadened its scope so as to include the American Student Health Association publications, recognizing that the physicians working in this field have opportunities for clinical observation and research unsurpassed and often unequalled by any other group in the nation. This material was thought to be of inestimable value to the men in the general practice of medicine, as well as those who confined their practice to limited fields. The present editorial policy is to further strengthen the JOURNAL by publishing only the most valuable and outstanding papers so that the definite contributions to medical knowledge made through its pages will continue to make of it an indispensable journal for the physician.

Therefore, in the Year of 1937 THE JOURNAL-LANCET plans to provide its readers with valuable and timely articles. It is the wish of the Editorial Board that the brightness of THE JOURNAL-LANCET's future may be reflected in the lives of its readers for the coming year.

J. A. MYERS, M. D.,
Chairman, Board of Editors

FARMERS' AID CORPORATION

The South Dakota State Medical Association has finally endorsed the program for medical relief proposed by the Resettlement Administration for certain drouth states. The society, after considerable hesitation, and a referendum, recommends to its members cooperation with the Farmers' Aid Corporation, that being the body set up by the Resettlement Administration for medical relief. The endorsement is for one year only. Druggists, hospitals, dentists, nurses and doctors are to be paid for strictly emergency services. The executive secretary of our state society assumes administrative responsibility.

The delay and hesitation of the state society in endorsing this program were due;

1. To the character of the original set-up of the corporation.
2. To advice to approach the program with great caution given by the legal department of the American Medical Association.
3. To the fear of advancing the cause of state medicine.

The Farmers' Aid Corporation at first provided a fifty-year tenure and had power to bring practically every citizen of South Dakota within its reach.

There is reason to believe that the medical director of the Resettlement Administration, Dr. Williams, neither approved nor desired such broad powers or long tenure. The original form was perhaps due to the usual habit of lawyers in giving the greatest possible freedom of action in articles of incorporation. The present form defines and limits activities more in harmony with the views of the society.

The states of North Dakota and Oklahoma had already accepted and endorsed similar programs. The other groups in South Dakota allied in our common front, namely, dentists, nurses, druggists and hospital associations, had also approved the program. The desire for unity in action and policy with these groups was a strong argument for endorsement by the State Medical Society.

The fear of state medicine in a rural state is, in my judgment, unfounded. The farmer is a very individualistic person, as many who have tried to develop co-operative farm groups have found to their disappointment. When we have rain and fair prices, our farmers will again hire their own doctors, choose their own hospitals, select their own nurses, and patronize their own druggists.

The advice of the legal department of the American Medical Association perhaps reflects fears brought about by conditions in Chicago. On a recent trip to Chicago, I was informed by a member of the staff of the Albert Billings Memorial Hospital that Chicago has now, to all practical purposes, state medicine. Cook County Hospital is now open to any Cook County resident who wants to enter. About the only restraining factor is class-feeling. The Albert Billings Memorial Hospital with over 700 beds, employs a full time staff (head of

eye department is the one exception) and the hospital, not the doctors, determines and receives the fees.

If the great majority of our farmers and a considerable proportion of city dwellers are to remain on relief basis, some sort of medical service must and will be made available. If they can become self-sustaining and have an adequate income, they will again prefer to provide their own medical care. The solution of our general economic problem will determine the nature of our system of medical service. Doctors, as I see it, will be able to influence the program largely, as they can aid in solving the common problem.

A. S. R.

THE LIVER

It is a glorious evidence of the advance in the healing art to observe from what various angles researchers determine the importance of the liver. The inherent researcher usually resists any attempts at overextension of his findings or conclusions; rarely does he venture to correlate his work with other than those engaged, like himself, in some intimate problem. Clinicians, wisely or unwisely, cultivate no such restrictions; and while they may wander too far afield in search of practical therapeutic or surgical principles, where they observe patients accurately they complement in no small way the cloistered investigator. It is thus that real advances are made.

A mere recital of the accepted functions of the liver, numerous as they are at this time, does not really do the organ justice. The recent development of protamine insulin, with its prolonged and steadied action, is reminiscent of the deaminizing function of the liver, and it appears that protamine insulin is something more akin to the natural products of the pancreas than is any type previously used.

Macrocytosis is no longer known as a specific sign of pernicious anemia; in a wide variety of clinical states it connotes perverted liver function. In nutritional edema and non-tropical sprue, however diverse the chemical endocrine or metabolic factors may be, it is evident that the liver stands as a balancing defense, assisting, if not controlling, the formation of the essential body fluids, until such time follows when it can no longer compensate.

The story of the liver is indeed an intriguing one and may gradually lead us back to the attitude of the ancients, who dubbed the nerve that supplied the diaphragm, the phrenic because, forsooth, it was the nerve of frenzy. They thought it connected the liver with the brain.

E. L. T.

CANCER MORTALITY RATE

What the tuberculin test and roentgenology have done to reduce the number of deaths due to tuberculosis, biopsy and the X-ray could do in reducing the mortality rate of cancer.

While contagion and isolation are factors in one and not the other disease, early diagnosis is the crux of the

problem in the conquest of both. At the beginning of the present century, tuberculosis was Captain of the Legions of Death. Now, cancer is usurping the position of priority, and with its ascendancy, demand is increasing that the problem be solved.

In 1885, the X-ray was discovered. In 1908, Mantoux perfected the tuberculin test. Since then, champions in the anti-tuberculosis fight combined their use to such an advantage that every practitioner now has a successful approach to any case suggestive of tuberculosis. It has been the simplicity and universality of their usage which has helped reduce the mortality rate of the disease.

Biopsy is only slightly more complicated than the Mantoux test. X-ray facilities are available to every physician. When these two procedures occupy the mind of every physician studying a case with symptoms suggestive of cancer, the mortality rate of cancer will begin to decline. Briefly then, "When in doubt, biopsy or X-ray."

J. E. S.

REPORTS OF SOCIETIES

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE Meeting of October 7, 1936

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 7th, 1936. The meeting was called to order at 8 o'clock by the President, Dr. Thomas S. Roberts.

There were 52 members and one guest present. Minutes of the May meeting were read and approved. The scientific program consisted of two papers.

CHORDOMA by

Dr. Arnold Schwyzer, St. Paul

Dr. Schwyzer read a paper on the above subject, reported a case, and showed lantern slides.

Discussion

DR. J. F. CORBETT (Minneapolis): I greatly enjoyed listening to this very complete discussion. I personally have had but one case of chordoma, and that was just the opposite of Dr. Schwyzer's case. At the time I saw it, there was a large tumor involving the second and third and several other cranial nerves. It was on the front of the sphenoid. The remarkable thing about it was that it could not be removed because of its size. A decompression gave relief for a long period of time. The tumor was undoubtedly slow in growth, although it was cellular, which would indicate there was some malignancy.

DR. ROBERT EARL (St. Paul), in discussion of Dr. Schwyzer's paper, reported the following case of chordoma:

The patient, Miss L., age 46, unmarried, first consulted me on April 6, 1936. Her family and personal history were negative.

All of her laboratory findings were negative, except for a moderate secondary anemia. She had never been sick until August 15, 1935, when she developed a severe bearing-down pain in the rectum which was more or less constant for two weeks. She consulted a physician who told her she had a hemorrhage in the rectum. The patient had never seen any blood in the stool. Hot sitz baths relieved her discomfort temporarily. The pains and discomfort improved some, so she taught school until April 3, 1936. On February 2, 1936, she was examined

by another physician, who diagnosed tumor of the uterus and advised operation. When I saw her on April 3, 1936, her appetite and digestion were normal. With the aid of mineral oil, she had one slender-formed stool a day. No blood or mucus were seen in the stools. Her periods had been irregular the past few months. Her general physical examination was negative.

Pelvic examination disclosed a tumor in front of the sacrum and left side of the pelvis extending down to the sphincter ani. The vagina and rectum were pushed to the right anterior part of the pelvis. The cervix could not be reached. Some irregular masses could be palpated on the lower abdomen just above the pubis.

On April 9, 1936, I explored through a midline suprapubic incision. I found the uterus, tubes and ovaries essentially normal, but pushed up into the abdomen and resting on top of a tense mass which filled the entire pelvis. On opening into this mass, I found a broken-down degenerated mass containing some brown cystic fluid and masses of broken-down tissue filling the entire pelvis. I removed as much as possible of the degenerated mass, and swabbed the cavity with formalin solution. I packed the cavity with gauze, one end of which was brought through an opening made in the vault of the vagina, through which it was removed two days later.

The tubes and ovaries were removed. The uterus was not removed, but was retroverted and sutured over the peritoneal line of incision to reinforce it, and protect the peritoneal cavity.

Although the patient was given four postoperative courses of deep X-ray therapy, the growth is recurring.

The microscopic section shows one of the typical forms of chordoma of the more malignant type. On the lantern slide, one can see the similarity to parts of the section from Dr. Schwyzer's case.

DR. R. G. ALLISON (Minneapolis): Several months ago we had a young man sent in to us for X-ray examination who had sustained a rather trivial injury to his back. The injury was more on the order of a strain. We found a clean-cut line of cleavage, showing only in the lateral plate, bisecting the body of one of the lumbar vertebra. Subsequent plates have shown no change in this line of cleavage. The consultants who have seen this have diagnosed it as a remnant of the notochord. This is the first of such cases I have seen and I have seen none mentioned in the literature. I wonder if Dr. Schwyzer could tell us if he has seen any such findings shown by X-ray examination.

DR. ARNOLD SCHWYZER (in closing): I am sorry I cannot answer Dr. Allison's questions because I have not any sufficient experience in these cases as to the X-ray findings.

The two cases reported by Dr. Corbett and Dr. Earl show how these cases vary in malignancy. The case reported by Dr. Corbett is that of a slow insidious growth. In that case, decompression would do good for a while; whereas, in the very malignant case Dr. Earl reported, I do not think there is much to be done unless one could get such a case at a very early date.

As for the diagnosis—I made that diagnosis myself when I began to think about the case; and, on examining the sections carefully, it was plain that we had a chordoma. The location of these tumors is of great importance for the diagnosis. Ewing said the location was more important than the microscopic appearance. The microscopic picture may vary very much. Thus the combination of the topography together with the microscopic findings is important for the diagnosis.

* * *

SEVERE CUTANEOUS REACTIONS TO THE BARBITURATES

by

Drs. S. E. Sweitzer and Carl W. Laymon
Minneapolis

Summary

1. Attention is called to the possible dangers attendant with the administration of the barbiturates.

2. Four cases (three of which were fatal) of severe cutaneous reactions to these drugs were reported.

3. The theoretical consideration of drug eruptions with reference to the mechanism of sensitivity, the localization of the

shock tissue, and the types of eruptions were briefly presented.

4. The resemblance of drug allergy to serum disease and of certain eczematous drug eruptions to dermatitis of external origin, makes it probable that the differences between these three types of allergy (drug allergy, serum disease and contact dermatitis) are not great.

5. It is believed that the site and type of hypersensitive tissue which an excitant (drug, serum or external agent) reaches is the chief factor in the type of response to that excitant, rather than the mechanism of sensitization, or the route by which the excitant reaches the tissue.

Discussion

DR. E. L. GARDNER (Minneapolis): I am particularly interested in this paper because, in functional gastrointestinal disturbances, phenobarbital in $\frac{1}{4}$ grain (or less) doses is used over long periods of time. Personally, I have never seen any reaction when prescribed in these small doses. Skin reactions, usually occurring early, may occur after taking $1\frac{1}{2}$ to 5 grains in 24 hours; but these chronic cases taking the small doses even for many months do not show skin reactions or depression of the leukocyte count. Possibly the repeated small doses desensitize the patients to the drug. I wonder if Dr. Sweitzer has ever seen any reactions when the dose has been not over $\frac{3}{4}$ grain in any 24 hours? The cases Dr. Sweitzer reported were very ill from other diseases, and this general debility may have been the most important factor.

I think this is a very important contribution. Many of the supposedly "harmless" drugs may sometimes produce serious results—mineral oil sprays in the nose may produce a very serious type of chronic pneumonia and the long-continued use of magnesium may produce serious calcium depletion.

DR. FRANKLIN WRIGHT (Minneapolis): About 35 years ago, when I studied dermatology, about 400 different drugs had been reported as producing eruptions on the skin. In the last few years our American pharmacists have outdone themselves in supplying good drugs. I have had no experience with barbital skin eruptions; but had an experience with barbital which I would like to report. I did a prostatectomy and in four days the patient was sitting up in bed. His physician came in on the fifth day and ordered albarbargene (a barbital compound) 5-grain tablets, one tablet at 4 p. m., one at 7 p. m., and one at 11 p. m. At 3 o'clock the next morning the hospital called me. I found the patient with a pulse of 150 and I thought he would not live until daylight. I ordered hypodermoclysis, and filled him with strychnine, and he gradually got better. Now at the end of six weeks he is still in a wheel chair, making a very slow recovery.

I believe that his collapse was due to barbital contained in the albarbargene.

DR. R. T. LA VAKE (Minneapolis): I agree with Dr. Gardner that this is a very important subject. I suppose few use the barbiturates more than the obstetrician. We have used pentobarbital in practically every labor since it came upon the market. In this period we have seen only three or four cases of mild dermatitis due to its use. It seems to me that the crux of the matter lies in warning against the continuance of the drug at the first untoward sign. To my mind, we should not deprive patients of the benefits of the barbiturates through the exaggeration of their danger.

I agree thoroughly with Dr. Roberts that the indiscriminate sale of these drugs without prescription should not be allowed.

If I am not mistaken, three of the four fatal cases reported in this paper were found to have a bronchopneumonia at autopsy. It would suggest itself to me that these cases might be interpreted as very sick people who happened to receive barbiturates. I would like to ask if it was supposed that the bronchopneumonia was a result of the barbiturates?

DR. C. B. WRIGHT (Minneapolis): I would like to ask Dr. Sweitzer whether any of these patients showed any other evidence of allergy, or whether in the literature there is any indication that these people are allergic to other drugs. In allergies, the dosage is not so important as the degree of allergic tendency of the individual.

DR. PAUL O'LEARY (Rochester): There are two points I should like to discuss in regard to eruptions from the barbituric acid derivatives. The first is the so-called delayed reaction, in which the eruption may not appear until three to five days after the drug has been stopped. The cutaneous picture of this type of eruption is similar to that described by Dr. Sweitzer. I was surprised to hear the comments of the previous discussors on the rarity of eruptions from the barbiturates, because in dermatological practice during the past five or six years these manifestations of intolerance to the drug have been quite common. Perhaps the recent efforts of the manufacturers to produce remedies that are apparently less toxic than the original preparations account for the scarcity of these reactions now in general practice and surgical work.

The second point which I wish to bring out is illustrated by the recent work of Wise and Wile and their co-workers, who endeavored to study the role of allergy in the production of these lesions. Both of these investigators excised a plaque of dermatitis which had developed following the ingestion of a barbiturate, and made a full-thickness graft of this plaque on an area where the eruption had previously not appeared. The excised normal skin was grafted over the area where the dermatitis developed, and from which the plaque had been excised. On administering a barbiturate within a week after the graft, the eruption re-appeared in the patch of dermatitis that was transplanted. However, if several months were allowed to elapse, the grafted area soon lost its sensitivity; likewise, the normal skin which had been transplanted to the area of dermatitis did not develop the dermatitis, although the dermatitis tended to develop in other areas. It would appear, therefore, that the sensitivity is not a localized affair in the sense of a localized allergic area, but is rather of a systemic nature.

DR. C. B. DRAKE (St. Paul): I have run across skin reactions following the use of luminal in just two instances. One was an elderly patient at the City Hospital who, following the taking of about $1\frac{1}{2}$ grains of luminal for several nights, developed a severe dermatitis with extensive petechial hemorrhages. He recovered and later, through an error, was given luminal again, and went through the same process. The other instance was in a private patient who developed a macular eruption from one small dose of luminal.

In this connection I wish to report what was apparently an unusual experience I had last winter from the use of quinidine. An elderly woman was given two grains of quinidine after dinner one night because of extrasystoles. In the early morning hours she awoke with severe burning in her skin, and when I saw her she had a generalized erythema and later even petechial hemorrhages in both legs. General desquamation followed involving the palms and soles. Inasmuch as she had had a small dose of luminal the two preceding nights, I was unconvinced that the quinidine was the cause of the dermatitis. Two weeks later one grain of quinidine produced the same symptoms, although in milder form. I assured myself that the druggist had made no mistake in the prescription, and had a laboratory confirm the identity of the drug. This patient had taken quinine as a young woman without any untoward effect. She had, however, suffered from a severe dermatitis some years ago following the use of some hair tonic which I imagine may have contained some quinine. An interesting aftermath of her recent experience was the appearance of irregular ridges across the nails of fingers and toes, which was doubtless the result of the effect of the cutaneous reaction on the matrix of the nails. This evidently is a very unusual instance of sensitiveness to quinidine, as the drug is used so extensively, and the skin specialists I have questioned have none of them had a similar experience.

DR. R. D. MUSSEY (Rochester): I just want to add a word to Dr. LaVake's discussion. We have been using these drugs for analgesia in confinement cases since 1929, and I think Dr. O'Leary will bear me out that his group has not been called in at any time on account of an eruption due to the barbiturates.

I think Dr. Sweitzer's paper is very timely, and that one should use the barbiturates with care; but I do not think we ought to throw this medication aside because of an occasional

case of this sort. I am sure the average patient in labor can take this medication without any appreciable number of them developing drug eruption.

DR. H. E. MICHELSON (Minneapolis): I am heartily in accord with the gentlemen who have suggested that the sale of barbiturics should be definitely controlled by law. The change of psyche due to the long-continued use of these drugs is much more serious than the rare cutaneous involvement that Dr. Sweitzer has reported. When an eruption does occur the external treatment is essentially that of any dermatitis and internally the use of alkalis.

DR. THOMAS S. ROBERTS (Minneapolis): In its broader application this is a subject of much more than passing interest. While the cutaneous reactions following the administration of barbiturates to persons with allergic sensibilities, especially those in impaired health, may be serious or even fatal, as described by Dr. Sweitzer, the subject of the general use of these drugs is of much wider and more vital importance. Thousands and thousands of people, with or without the advice of physicians, are taking regularly one or another of the various barbiturate preparations, frequently with deleterious effects and not uncommonly with disastrous results. In this, and in most states, these drugs are sold over the drugstore counter without restriction and conscientious druggists are worried and appalled at the extent to which the evil has grown. Barbiturates are all habit-forming and their consumption has become almost a national evil.

The regular taking of even small doses of the barbiturates and their special administration in large doses produces, in addition to the sedative effect, a suspension of the coordination of both the mind and body. The extent of these effects varies of course with the susceptibility of the individual; but it not infrequently results in chronic cases in the disorganization of the mental faculties and a muscular incoordination suggestive of locomotor ataxia. In the more common cases the mind is confused, the speech thickened, and muscular movements in general are disordered and clumsy—much like an intoxicated person. The normal personality is lost. The mental condition may even simulate insanity with homicidal or suicidal intent. One case that came under my notice was committed to an asylum after attempting to shoot his wife; but made a speedy recovery after the withdrawal of the drug—much to the surprise of the attendants, who were not aware of the cause. Another patient, after taking 10 grains of veronal three times daily for a short period, escaped and ran amuck armed with a brick with which he threatened all who interfered. He returned to normal after suspension of the drug. A business man of large interests lost the ability to dictate a letter, to look after his affairs, became almost helpless physically, had retention of the urine so that the use of a catheter became necessary; but recovered slowly after the daily doses of veronal were discontinued. Cases of this kind could be multiplied many times from my own experience; but it would take too much time to recount them here. Suffice it to say, that they have led me to feel and to believe that the profession is handling (in the case of barbiturates) drugs that are so potent and so habit-forming that they should be used with very especial care and caution. As soon as possible, a law should be passed prohibiting the indiscriminate dispensing of these drugs in this state, as has already been done elsewhere.

DR. C. B. WRIGHT: It may interest Dr. Roberts to know that several states have already passed laws restricting the sale of barbiturates and that such a law is contemplated in Minnesota if the druggists and pharmacists will cooperate.

DR. SWEITZER (in closing): In answer to Dr. Gardner's question, we have not seen reactions when the dose of barbiturate has not been over $\frac{3}{4}$ grain in any twenty-four hours. In most of our cases, however, the exact dose was not determined, since the drug was administered by physicians other than ourselves. Our patients, however, were not seriously ill from other diseases except the one who developed granulocytopenia.

In reply to Dr. LaVake, we felt that the bronchopneumonia which was found at autopsy represented a terminal complication, since no signs of pneumonia were found on the first examination.

As to the question of Dr. C. B. Wright, patients with drug allergy usually give no history of other personal or familial allergy.

Our purpose in presenting this paper was to call attention to the potential dangers of the barbiturates rather than to decry their proper use by physicians who are alert to these dangers.

R. T. LAVAKE, M. D.

The meeting adjourned.

SIOUX VALLEY MEDICAL ASSOCIATION

Sioux City, Iowa, January 19 and 20, 1937

Dr. Gilbert Cottam, of Minneapolis, will serve as toastmaster at the 40th annual meeting of the Sioux Valley Medical Association at Sioux City, Iowa, on January 19 and 20, 1937.

Other speakers are: Karl A. Meyer, M. D., associate professor of surgery in the Northwestern University Medical School, Chicago; Joseph L. Baer, M. D., clinical professor of obstetrics and gynecology in Rush Medical College of the University of Chicago; Fremont A. Chandler, M. D., assistant professor of orthopedic surgery in the Northwestern University Medical School; William F. Braasch, M. D., professor of urology in the University of Minnesota Graduate School of Medicine at Rochester, Minn.; Roger L. J. Kennedy, M. D., assistant professor of pediatrics in the University of Minnesota Graduate School of Medicine at Rochester; Horace M. Korns, M. D., associate professor of the theory and practice of medicine in the University of Iowa College of Medicine at Iowa City; and Charles W. Poynter, M. D., professor of anatomy and dean of the College of Medicine of the University of Nebraska at Omaha. Dr. Poynter will deliver the principal address of the evening on January 19 (banquet).

Officers of the Sioux Valley Medical Association are: Frank P. Winkler, M. D., president; Sibley, Iowa. L. L. Sogge, M. D., vice-president, Windom, Minn. H. I. Down, M. D., secretary, Sioux City, Iowa. Walter R. Brock, M. D., treasurer, Sheldon, Iowa.

NEWS ITEMS

Dr. Leonard J. Nilles, who was graduated from the University of Minnesota Medical School last June, is now in practice at Rollingstone, Minn.

Dr. George E. Whitson, of Madison, S. D., a graduate of the University of Minnesota Medical School in 1927, recently was elected president of the Madison Community Hospital.

Dr. Chester A. Stewart, clinical professor of pediatrics in the University of Minnesota Medical School, will represent the United States next year at the worldwide medical conclave in Italy. Dr. Stewart will be the representative of American pediatrics.

Dr. August E. Bostrom, in practice for several years at DeSmet, S. D., has accepted a position with the State Board of Health of Oregon, with offices in Portland.

Dr. J. Arthur Myers, professor of medicine in the University of Minnesota Medical School was a guest speaker at the Rocky Mountain Tuberculosis Conference at Albuquerque, New Mexico.

Dr. Henry E. Michelson, Minneapolis, recently spoke before the Milwaukee Dermatological Society on "Tuberculosis of the Skin."

Dr. Allan B. Stewart, Owatonna, Minn., was a member of the committee in charge of arrangements for

the annual tri-city dinner meeting of the Rotary Clubs of Owatonna, Faribault, and Northfield; the dinner itself being held in Faribault.

Dr. C. Francis Ewing, of Wheaton, Minn., won the championship cup of the golf match sponsored among members of the Great Northern Railway Surgeons' Association, of which THE JOURNAL-LANCET is the official publication, at Seattle, Washington, during October.

Elias P. Lyon, Ph. D., former dean of the University of Minnesota Medical School was recently honored at a farewell dinner by the faculty members of the School of Nursing at the University. Dean and Mrs. Lyon are now in Florida for the winter.

Dr. John F. Regan, who for the past seven years has been assistant superintendent of the North Dakota Hospital for the Insane at Jamestown, has resigned to accept a similar position at the Howard State Hospital in Providence, Rhode Island.

Dr. Arthur L. Abbott, a recent graduate of the University of Minnesota Medical School, is now attached to the Civilian Conservation Corps at Camp Badger, California.

The Northwest District Medical Society of North Dakota met at Minot on December 3rd, with Dr. Arthur C. Kerkhof, assistant professor of medicine in the University of Minnesota School of Medicine, as guest speaker. Professor Kerkhof's subject was: "Gastric Malignancy, Including Gastroscoy and Super-Voltage Therapy."

The regular meeting of the Minnesota Academy of Medicine was held at the Town & Country Club in Saint Paul on December 9, 1936. Dinner was served at 7:00 p. m., and the meeting was called to order at 8:00 p. m. Guest speaker was Dr. W. L. Benedict, professor of ophthalmology in the University of Minnesota Graduate School of Medicine, Rochester. Professor Benedict spoke on "Episcleritis in Relation to Disease of the Pelvic Organs."

The new \$250,000 Municipal Hospital at Virginia was formally opened to visitors during the last week of November and the early days of December. The superintendent is Miss Charlotte J. Garrison.

Dr. Ralph C. Adams, of Bird Island, Minn., was elected president of the Renville County Medical Society at its regular election meeting.

Dr. John Hettwer, 67, a retired physician of St. Paul, Minn., died on November 25, at the home of his son, Herbert G. Hettwer.

Dr. Herman E. Almquist, 52, who practiced medicine for 15 years in Minneapolis before moving to the Pacific Coast, died in Los Angeles, Cal., in November. Dr. Almquist was a graduate of Macalester College in St. Paul, and the Loyola University School of Medicine in Chicago, Ill.

Dr. Helen Louise Crawford, roentgenologist at the Winona General Hospital, Winona, Minn., has returned from the University of Iowa Hospital at Iowa City,

where she passed the requirements of the American Board of Radiology.

Dr. Otto Fesenmaier, of New Ulm, Minn., has located in his home town. He was graduated from the Marquette University School of Medicine in June, 1936.

The Sharon Lodge, A. F. & A. M., of Willmar, Minn., will furnish a room in the new Rice Memorial Hospital of that city, it has been announced.

Dr. E. A. Kilbride, of Worthington, Minn., is the new president of the Southwestern Minnesota Medical Society.

Dr. Paul C. Leck, of Austin, Minn., is the new president of the Mower County Medical Society.

Dr. J. E. Campbell, widely-known South St. Paul physician, was killed eight miles out of St. Paul on November 24. Dr. Campbell was the first cheer leader of the University of Minnesota, from which he was graduated in 1901. He was a pediatrician.

Dr. E. O. Church, Menno, South Dakota, died suddenly on December 3, 1936, of a heart attack. He was a graduate of the University of Illinois College of Medicine in 1900. Dr. Church had practiced medicine in Revillo, South Dakota, for 24 years, and in Menno for 4 years.

Dr. N. H. Baker, of Fergus Falls, Minn., secretary of the Park Region Medical Society, reports that the Society held its annual meeting at Fergus Falls on December 9, 1936. Dr. J. B. Vail, Henning, was installed as president; Dr. L. C. Combacker, of Fergus Falls, was chosen president-elect; Dr. C. J. Lund, Underwood, was selected vice-president; Dr. T. S. Paulson, Fergus Falls, was chosen treasurer; and Dr. Baker was elected secretary. Dr. S. Marx White, of Minneapolis spoke on "The Early Treatment of Hypertension."

According to a report received from Dr. C. W. Froats, retiring secretary, the Red River Valley Medical Society held its annual meeting on December 8, 1936, in the Hotel Crookston, at Crookston, Minn., with an attendance of 37 members and 4 guests. President W. W. Will, M. D., of the Minnesota State Medical Association, was a guest speaker, as was also Dr. W. L. Burnap, of Fergus Falls, Minn., councilor of the 8th district; and Mr. R. R. Rosell, of the state medical association's offices in Saint Paul. Dr. J. L. Delmore, of Roseau, was elected president for 1937; Dr. C. W. Froats, of Thief River Falls, was chosen vice president; Dr. C. L. Oppegaard, of Crookston, was selected secretary-treasurer; and delegates elected are: Dr. J. F. Norman, Crookston; Dr. O. E. Locken, Crookston; their alternates being Dr. H. M. Blegen, Warren; and Dr. W. F. Mercil, Crookston. Dr. W. G. Paradis, Crookston, was elected censor for 3 years.

Henry S. Plummer, M. D., chief of the division of medicine of the Mayo Clinic, and professor of medicine in the University of Minnesota Graduate School of Medicine at Rochester, Minn., died at his home in Rochester on December 31, 1936, at the age of 62. He was an internationally known authority on exophthalmic goiter.

The Fourth Annual Lecture in the E. Starr Judd Lectureship in Surgery, established at the University of Minnesota by the late Dr. E. Starr Judd, will be given by Dr. Evarts A. Graham, Professor of Surgery, Washington University School of Medicine, and Surgeon-in-Chief, Barnes and St. Louis Children's Hospitals, at St. Louis, Missouri. The lecture will be held in the Chemistry Auditorium on the University campus in Minneapolis on Wednesday, February 3, at 8:15 p. m. The subject of Dr. Graham's lecture will be "Accomplishments of Thoracic Surgery and its Present Problems."

Dr. E. Sydney Boleyn, secretary of the Washington County (Minn.) Medical Society, reports that his group held its extra meeting on September 15 at Stillwater, Minn., given over to economics. The regular monthly meeting was held October 13, speaker being Dr. Howard Gray, of Rochester; another meeting was held November 10th, at which Dr. Walter Fansler, of Minneapolis, spoke on "Rectal Pathology." Dr. George Earl and Mr. Manley Brist, St. Paul, were speakers also.

Dr. Henry J. Leigh, Tower City, N. D., died in Grand Forks on October 22, 1936, at the age of 70. He was a graduate of Bennett Medical College in Chicago, Ill., in 1891. He had practiced in Sabula, Iowa; Fort Dodge, Iowa; Carroll, Iowa; Lakefield, Minn., from 1909 to 1924; and Tower, N. D., from 1924 to 1936. Dr. Leigh is survived by his widow, Mrs. Agnes Leigh; two daughters; and one son, Dr. Ralph E. Leigh, of Grand Forks.

H. R. Hummer, M.D., secretary of the Seventh District Medical Society, Sioux Falls, S. D., reports that the December meeting of the Society was held on December 8, with dinner at 6:30 p. m. in the Cataract Hotel in Sioux Falls. Dr. B. A. Dyar, secretary of the South Dakota State Medical Association, was guest speaker. New officers for 1937 were elected. Dr. Frederick C. De Vall, of Garretson is the new president; Dr. N. J. Ness, Sioux Falls, is vice-president; Dr. H. R. Hummer, Sioux Falls, is secretary; Dr. G. E. Van Demark, Sioux Falls, censor for one year; Dr. Charles F. Culver, Sioux Falls, censor for two years; Dr. E. L. Perkins, Sioux Falls, censor for three years; Doctors Roy G. Stevens, J. B. Gregg, and L. J. Pankow, all of Sioux Falls, delegates for two years; and Doctors M. O. Lanam, J. A. Kittleson, and Goldie Zimmerman, all of Sioux Falls, alternate delegates.

William F. Snow, M.D., general director of the American Social Hygiene Association, Inc., New York City, and author of *Individual Prophylaxis in Theory and Practice as Applied to Syphilis and Gonococcal Infections* in the June, 1936, issue of THE JOURNAL-LANCET, advises that February 3rd, 1937, will be designated as Social Hygiene Day. Physicians interested in this aspect of medico-sociological endeavor are urged to communicate with Dr. Snow at 50 West 50th Street, New York City.

UNIVERSITY OF MINNESOTA CENTER FOR CONTINUATION STUDY POST-GRADUATE MEDICAL INSTITUTE

The Center for Continuation Study of the University of Minnesota in cooperation with the Medical School and the Minnesota State Medical Association will offer a series of post-graduate medical courses for practicing physicians from January 17 to February 13, 1937. They are planned primarily for practicing physicians who desire to spend a short period of time in serious and intensive study in internal medicine, surgery, pediatrics, obstetrics and gynecology.

Subjects

The first week, from January 17 to January 23, will be devoted exclusively to instruction in traumatic surgery; the second week, from January 24 to January 30, to obstetrics and gynecology; the third week, from January 31 to February 6, to pediatrics; and the fourth week, from February 7 to February 13, to internal medicine. It will be possible for any postgraduate student to enroll in one or more of these courses. Preference will be given to those enrolling in the entire series although single week reservations will be welcomed. Students are urged to live in the building which provides splendid facilities for both instruction and living accommodations. In addition to the full-time enrolment, a limited number of physicians from the Twin Cities and vicinity may be accepted for part-time enrolment.

Program

In planning the courses, the program has been divided on the basis of regions, systems, or types of disorders. New chairmen will be in charge of each day's program and the faculty which will assist them will function as a unit.

Special Features

New registrations will be completed on each Sunday prior to the start of the week's work for those who have made advance reservations. Students are urged to come at this time and receive their programs and room assignments.

Registration and Tuition Fees

The tuition fee for each week's course will be \$15.00 for full-time enrolment. An advance registration fee of \$3.00 must be sent with the application. This registration fee will be deducted from the tuition after the registration is completed. Address all applications or requests for information to the Director of the Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota. The enrolment is limited to thirty students for each week.

Certificate

Upon satisfactory completion of any one or more weeks of full-time enrolment a certificate of attendance will be issued by the Board of Regents of the University of Minnesota upon the recommendation of the director of the Center and the chairman of the Post-Graduate Medical Institute.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON NOVEMBER 7, 1936
(OCTOBER EXAMINATION)

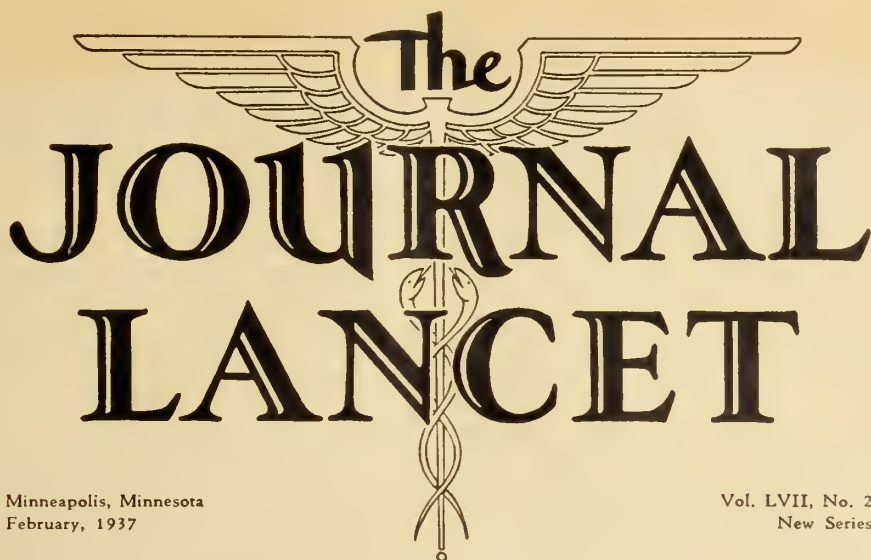
Name	School	Address
Boehrer, John James, Jr.	Johns Hopkins U., M.D., 1936	500 Harvard St. S. E., Minneapolis, Minn.
Brink, Donald	U. of Minn., M.B., 1936	St. Barnabas Hospital, Minneapolis, Minn.
Brockman, Helen	U. of Minn., M.B., 1933, M.D., 1934	Independence, Ia.
Burchell, Howard Bertram	U. of Toronto, M.D., 1932	Mayo Clinic, Rochester, Minn.
Cady, Joseph Bishop	U. of Pa., M.D., 1934	Mayo Clinic, Rochester, Minn.
Canfield, Burt Joseph	U. of Minn., M.B., 1936	Miller Hospital, St. Paul, Minn.
Castigliano, Silvio Gordon	Rush Med. Col., M.D., 1936	736 Lincoln Ave., St. Paul, Minn.
Caveny, Kasper Patrick	U. of Minn., M.B., 1936	Bethesda Hospital, St. Paul, Minn.
Cleveland, William Hatcher	Northwestern U., M.B., 1935, M.D., 1936	Mayo Clinic, Rochester, Minn.
Crumpacker, Leo Kyle	Northwestern U., M.B., 1934, M.D., 1935	Mayo Clinic, Rochester, Minn.
Cutler, Haydn Harrison	Northwestern U., M.B., 1935, M.D., 1936	Mayo Clinic, Rochester, Minn.
Fesenmaier, Otto Bernard	Marquette U., M.D., 1936	New Ulm, Minn.
Furey, Ellen Dora	U. of Texas, M.D., 1930	Mayo Clinic, Rochester, Minn.
Gilsdorf, Amos Roy	U. of Minn., M.B., 1936	Minneapolis Gen. Hosp., Minneapolis, Minn.
Gober, Olin Burr	U. of Texas, M.D., 1933	Mayo Clinic, Rochester, Minn.
Graham, Robert Williams	Toronto U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Haines, Diedrich Jansen	U. of Iowa, M.D., 1934	Mayo Clinic, Rochester, Minn.
Helm, Standiford	Northwestern U., M.B., 1935, M.D., 1936	Mayo Clinic, Rochester, Minn.
Heyerdale, William Wentworth	La. State U., M.B., 1934, M.D., 1935	Mayo Clinic, Rochester, Minn.
Johnson, Evelyn V.	U. of Minn., M.B., 1934, M.D., 1935	2600 Vincent Ave. N., Minneapolis, Minn.
Kaufman, Edward John	U. of Minn., M.B., 1935, M.D., 1936	1897 Summit Ave., St. Paul, Minn.
Kearney, Rochfort Wynn	Northwestern U., M.B., 1935, M.D., 1936	Mayo Clinic, Rochester, Minn.
Korchik, John Peter	U. of Manitoba, M.D., 1935	3105 E. Franklin Ave., Minneapolis, Minn.
Lawn, Harold Julius	U. of Minn., M.B., 1934, M.D., 1935	1105 W. Broadway, Minneapolis, Minn.
Lawn, Ray Arnold	U. of Minn., M.B., 1935, M.D., 1936	1105 W. Broadway, Minneapolis, Minn.
Lindberg, Vernon Leslie	U. of Minn., M.B., 1936	3838 Queen Ave. N., Minneapolis, Minn.
McCree, Dorothybelle	U. of Minn., M.B., 1935, M.D., 1936	1897 Summit Ave., St. Paul, Minn.
McKinnon, Daniel Angus, Jr.	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Mann, Arthur Seldon, Jr.	Med. Col. of Va., M.D., 1934	Mayo Clinic, Rochester, Minn.
Mason, Larkin Keith	Tulane U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Neel, Harry Bryan	Johns Hopkins U., M.D., 1932	Mayo Clinic, Rochester, Minn.
Olson, Alton Curtis	U. of Minn., M.B., 1933, M.D., 1934	2425 34th Ave. S., Minneapolis, Minn.
Paine, John Randolph	Harvard U., M.D., 1931	41 Clarence St. S. E., Minneapolis, Minn.
Rosenow, Edward Carl, Jr.	Harvard U., M.D., 1935	Mayo Clinic, Rochester, Minn.
Rushton, Joseph George	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester, Minn.
Schubert, John William	U. of Minn., M.B., 1936	Minneapolis Gen. Hosp., Minneapolis, Minn.
Sickler, James Russell	Temple U., M.D., 1935	325 Harvard St. S. E., Minneapolis, Minn.
Siegel, John Sanford	U. of Minn., M.B., 1936	St. Mary's Hospital, Minneapolis, Minn.
Simison, Carl	Rush Med. Col., M.D., 1936	Hawley, Minn.
Stromgren, Delph Theodore	U. of Minn., M.B., 1936	Miller Hospital, St. Paul, Minn.
Tennison, William James	U. of Cincinnati, M.B., 1934, M.D., 1935	Mayo Clinic, Rochester, Minn.
Titrud, Leonard Albert	U. of Minn., M.B., 1935, M.D., 1936	U. S. P. H. S. Hospital, Lexington, Ky.
Vaughn, Louis Dysart	Northwestern U., M.B., 1934, M.D., 1935	Mayo Clinic, Rochester, Minn.
Wenzel, Gilbert Paul	U. of Minn., M.B., 1936	Bethesda Hospital, St. Paul, Minn.
Williams, Donald Hugh	U. of Manitoba, M.D., 1931	Mayo Clinic, Rochester, Minn.
Wilson, William Doak	Vanderbilt U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Woodruff, Robert	U. of Minn., M.B., 1936	Minneapolis Gen. Hosp., Minneapolis, Minn.

BY RECIPROCITY

Bray, Kenneth Eben	U. of Minn., M.B., 1934, M.D., 1935	Co. 1775, Allen Junction, Minn.
Burns, Floyd McKenzie	St. Louis U., M.D., 1935	Milan, Minn.
Formanack, Carl Joseph	Creighton U., M.D., 1935	Otoe, Neb.
Mulligan, Arthur Montgomery	U. of Neb., M.D., 1928	4040 Grand Ave., Minneapolis, Minn.
Van Winkle, Charlotte C.	Johns Hopkins U., M.D., 1921	Williston Road, R. 2, Hopkins, Minn.
Webster, LuVerne John	U. of Wis., M.D., 1933	Walker Sanatorium, Walker, Minn.

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Archer, George Ferguson, Jr.	Vanderbilt U., M. D., 1934	Mayo Clinic, Rochester, Minn.
Fischer, Milton Schnell	U. of Pa., M. D., 1933	c/o H. L. Fischer, 1767 First National Bank Bldg., St. Paul, Minn.
Kahler, James Elias	Col. of Med. Evang., M. D., 1936	Mayo Clinic, Rochester, Minn.
Sheppard, Charles Goodnow	U. of Minn., M. B., 1935, M. D., 1936	1214 7th St. S. E., Minneapolis, Minn.



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A Review of 1936 Literature on General Medicine*

By

J. O. Arnson, M. D.
Bismarck, North Dakota

IT IS a difficult task to review the medical literature of 1936 and report the important features of medical progress in a concise form, in order that the practitioner may benefit from the knowledge contributed by the authors. Medical literature has grown so voluminous, and matters of little consequence are discussed at great length in many journals—therefore, the reviewer finds himself obliged to choose the points which, in his estimation, will be of particular value and interest to the average medical man. This review purposes to give the reader a broad view of the entire field of literature during 1936 with emphasis on the contributions which will determine progress in medicine. Necessarily, many important facts will be omitted and details which might be interesting will be neglected; but with the references appended, those who are interested in further pursuing the investigation of any subject commented upon will be able to do so.

The various types of arthritis have attracted the attention of essayists and investigators during 1936. Schnabel and Fetter of the Philadelphia General Hospital report continued favorable results, in the gonorrheal type of arthritis, from the use of artificial fever therapy. This method of treatment has been of great value in the treatment of Sydenham's chorea. Hyperpyrexia in Sydenham's chorea with the aid of protein shock treatment (intravenous typhoid vaccine) has also given good results.¹

Rheumatoid arthritis continues to be a therapeutic problem. Rinehart of San Francisco reports an interest-

ing relationship between rheumatoid arthritis and rheumatic fever. It was noted that deficiency of vitamin C was apparently given as a causal factor in some cases that were classified as rheumatoid arthritis. From investigations it was suggested that vitamin C deficiency may be a predisposing factor in other types of arthritis by producing a locus of decreased resistance. The characteristic atrophic changes in the skeleton, muscles and skin, seen in rheumatoid arthritis, are seen in chronic vitamin C deficiency.²

Inasmuch as the treatment of chronic arthritis is a prolonged process, the economic situation of many patients demands that home treatment be carried out. Coulter of Chicago plans an excellent régime for home treatment, emphasizing heat, massage and exercise, to increase blood flow.³

In connection with the treatment of chronic arthritis, it is interesting to note the report of Schkurov on 219 cases of chronic rheumatic polyarthritis, in 116 of which parathyroidectomy was performed. A fairly large percentage of good results was obtained in his cases. The treatment, however, is not presented as a cure but is only one contribution in the numerous measures in the prophylactic and active treatment of these conditions. The procedure is not recommended until further investigations are pursued.⁴

RHEUMATIC FEVER: Inasmuch as the rôle of tonsillar infection as an etiologic factor in the production of rheumatic fever has long held an important place in the ideas of the medical profession, it is timely to call their attention to the review, "The Influence Of The Tonsils On Rheumatic Infection In Children" by

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Albert D. Kaiser, Rochester, New York. There has been considerable doubt as to the exact relationship of the tonsils to rheumatic fever. Frequently infection in the tonsils precedes rheumatism. On the other hand, many children subject to tonsillitis or sore throat do not show evidences of rheumatic disease. He made separate studies of three large groups of children which justify the opinion that tonsils have definite influence on the incidence of rheumatic disease in children. He concludes that the tonsils should be removed in every rheumatic child. The article is recommended for complete reading.¹⁰

"The Effects Of Winter On A Chronic Rheumatic Condition," is discussed by J. Barnes Burt of Devonshire, England. The geographic distribution of rheumatism reveals a rarity in hot, dry climates—common incidence was noted in the temperate zones and an absence in dry, cold climates. Lack of exercise, over-indulgence in food and insufficient sweating are contributory factors to this increased incidence of chronic rheumatic conditions in cold weather.¹¹

INFLUENZA: Pettit, Mudd and Pepper of Philadelphia, review the status of influenza virus. They conclude that the virus which has been the primary etiologic agent of human influenza, in widely separated areas of the world during recent years, appears to be a single immunologic entity. They show that both active and passive immunization of animals against this virus is possible. These facts offer encouragement for the ultimate control of influenza. This should stimulate the efforts of the workers in preventive medicine in the perfection of a practicable means of immunization before the coming of the next pandemic.⁵

MEASLES: Gunther Paschla of Berlin reports further encouraging results in the use of placental extract in measles prophylaxis. He advises the use of ten cubic centimeters of placental extract in nurslings and from fifteen to twenty cubic centimeters in older children.⁶

McGavran reported a limited number of cases in the prevention and treatment of measles with immune globulin. It appears that the use of immune globulin is another advance in the prevention of measles. A person should remember that the immunity is passive and temporary.⁷

POLIOMYELITIS: Progress in dealing with this disease has been restricted to the apparently unsuccessful attempts of workers to develop a vaccine which would produce a lasting immunity. Kolmer of Temple University reviews his work and reports success in immunizing forty-two monkeys with a living but attenuated vaccine, carrying four per cent emulsions of spinal cord in one per cent solutions of sodium ricinoleate. Over ten thousand children were immunized with the vaccine with apparently good results. He states that no person receiving the three doses had contracted the disease, but ten receiving one or two doses had done so.⁸

J. P. Leake reports twelve cases in which poliomyelitis followed injections of the treated virus, administered

to establish immunity against the natural disease. Reports of Leake make it apparent that further use of such a living virus is unjustifiable and should not be employed until the objectionable features that Leake reports are overcome.⁹

TULAREMIA: Lewis B. Flinn of Wilmington, Delaware, reports the use of a specific anti-serum in the treatment of tularemia. He reports thirty-two patients with clinical tularemia, of whom none died, all receiving anti-serum. His report is very encouraging in that it will be a valuable adjunct in the treatment of this disease.¹²

EPIDEMIC PLEURODYNIA: Kirkwood and Stoll of Sumner, Illinois, give an excellent report on this condition, which has been so prevalent throughout the country. A typical case presents an abrupt onset without any premonitory symptoms, with acute severe pain in the region of the diaphragm, lower thoracic wall or the epigastrium. Occasionally distention may appear in the upper abdomen. Rapid and shallow respirations accompany and headaches and backaches are noted. The temperature rises to 101 to 104. In twenty-four to thirty-six hours the severe pain disappears. Occasionally a second paroxysm will occur in one to two days, but rarely a third. They report the prognosis excellent and the treatment is symptomatic. Strapping of the chest and the administration of quinine are recommended. This condition evidently seems to be synonymous with acute diaphragmatic pleurisy.¹³

PNEUMONIA: The progress in the treatment of pneumonia lies wholly within the province of further development of specific sera for the various types. It is apparent that Type One gives by far the best results to specific serum therapy. There is some improvement over the death rate in the use of Type Two serum in Type Two pneumonia. The following contributions cover the new developments in serum therapy in detail.¹⁴

Pneumococci are now separated according to classification of Cooper into thirty-two specific serologic types. Of these one, two, three, five, seven and eight constitute seventy-five per cent of all cases of pneumonia. In infants and children of pre-school age, Types Fourteen and Six are the most frequent. Type One anti-pneumococcus serum gives the best results—Type Two not quite so good. Serums are also available for Types Five, Seven and Eight. No success has been obtained in producing an anti-serum which is effective against Type Three.

Howard, in reference to pneumothorax treatment of lobar pneumonia, is of the opinion it does not offer any particular advantages over other types of treatment.

TUBERCULOSIS: The observations of Myers, Harrington, Stewart and Wulff, of the University of Minnesota, note the importance of careful observation of individuals, particularly children, with first infection type of tuberculosis. It is felt that their studies should be read in detail by all practitioners because of their daily contact with this type of infection.¹⁵

In order to appreciate further the relationship of the childhood infection type and the adult type of pulmonary tuberculosis, the reviewer recommends Arvid Wallgren's contribution, which should be read by everyone interested in the treatment and control of tuberculosis.¹⁶

Regarding the progress made in the treatment of tuberculosis, it is interesting to note the greater application of surgical measures. It, manifestly, has had increasing success in many cases. The tendency is to employ surgical measures in greater numbers of cases. For instance, the evulsion of the phrenic nerve and artificial pneumothorax are being advocated in early lesions and collapse therapy, by means of thoracoplasty, more frequently.

BCG Vaccination In Western Europe—G. Gregory Kayne of London, discusses the vaccination against tuberculosis with attenuated tubercle bacilli in great detail. One is attempted to conclude that with further developments and further trial, if the vaccine produces increased resistance to tuberculosis, its use in children of families with open pulmonary tuberculosis would be justified.¹⁷

BRONCHIAL ASTHMA: The most important advance in the treatment of bronchial asthma during the past year has been the use of helium inhalations. The value of helium therapy is based upon the decreased effort of the respiratory tract, in breathing, due to the decreased weight of the volume of inhaled air. Marked relief has been obtained in paroxysms of bronchial asthma which did not respond to the usual measures of treatment. Thirty per cent helium mixture replacing the nitrogen in the usual atmosphere with an oxygen concentration of twenty per cent is the type of mixture which is used. This gives a density thirty-three per cent of air.¹⁸

The Use Of Mandelic Acid In The Treatment Of Urinary Tract Infections: Rosenheim published his paper on the "Use Of Mandelic Acid In The Treatment Of Urinary Infections," in May, 1935, and further contributions have been made, particularly by Helmholtz and Osterberg of the Mayo Clinic; and they call attention to the great value of this preparation in treating bacillary infections of the urinary tract of which *colon bacillus* is the most predominant etiological factor. The effects of mandelic acid on the cocci have not been sufficiently studied; but Helmholtz reports that several strains of staphylococci are about as susceptible to mandelic acid as the colon group. He also reports that several patients have been apparently cured of streptococcus urinary infections with mandelic acid. The oral administration of sodium mandelate will give .25 to 1% concentrations in the urine. A PH of 5 to 5.7 concentration of the urine is necessary.¹⁹

ARTERIOSCLEROSIS: Howard B. Sprague, Massachusetts General Hospital, reports that the etiological factors in degenerative vascular disease are as follows:

- (1) Food—increased deposit of cholesterol in sclerotic arteries indicates that foods with high cholesterol content should be eliminated.
- (2) The use of tobacco: tobacco causes vaso-constriction and peripheral vaso-constriction may be the primary mechanism of essential hypertension.
- (3) Alcohol in itself does not produce arteriosclerosis. The lack of judgment induced by alcohol may promote excesses in eating.
- (4) Arteriolar sclerosis.
- (5) Hereditary susceptibility.
- (6) Increased tempo of life is questionably a factor.
- (7) Increased incidence in males may be due to endocrine factors not known at the present time.

Dr. Sprague's conclusions are that the cause of degenerative vascular disease is unknown but the problem is being more clearly defined by chemical analyses of the vessels and study of experimental arteriosclerosis.²⁰

Chemical Aspects of Arteriosclerosis were studied by R. S. Austin and Pearl M. Zeek of the Cincinnati General Hospital. They found there is more alcohol-ether soluble material and increased calcium in sclerotic aorta than in the normal. These alcohol-ether soluble materials were cholesterol, cholesterol esters, fatty acids and small amounts of phospholipids. They explain the infiltration of lipids into the wall of the aorta by an increased cholesterol content of the serum and an infiltration of the lipids into the wall during systole. In age certain changes in the colloid character of the elastic tissue of the artery occurs so that the lipids may be bound or precipitated. Besides age, any condition which influences blood pressure or which disturbs the cholesterol metabolism or causes disease of elastic tissue, may be operative.²¹

Consideration of the recent developments in the treatment of hypertension would not be complete without reference to the development that has taken place in the neuro-surgical field. At the University of Michigan and at the Mayo Clinic, Rochester, Minnesota, apparently good results have been obtained in selected cases of hypertension. Adson, Craig and Brown of Rochester, Minnesota, conclude from their experiences that definite results have been obtained by extensive operative procedures, consisting of (1) bilateral ventral rhizotomy of the thoracic and lumbar roots, extending from the sixth thoracic to the second lumbar inclusive, and, (2) subdiaphragmatic splanchnic resections with removal of the upper two lumbar ganglia and resection of the suprarenal gland. They report that the latter operation may be more effective in controlling symptoms of essential hypertension than the former. A limited number of patients failed to respond and some obtained clinical improvement without much decrease in the blood pressure, some of these having had a recurrence of their old symptoms and the high blood pressure. They feel the immediate results have justified the treatment. They are encouraged to continue operative measures in the hope that better selection of cases may be made.²⁴

Nature Of Peripheral Resistance In Arterial Hypertension With Special Reference To The Vascular Motor System: Prinzmetal and Wilson of Harvard University carried on an investigation regarding the following questions:

1. Is the increased peripheral resistance in hypertension generalized throughout the systemic circulation or confined to the splanchnic area?
2. To what extent are the vessels responsible for the increased peripheral resistance capable of dilatation?
3. What part is played by the vasomotor nerves in the maintenance of the increased peripheral resistance?

They found that increased vascular resistance in the different types of hypertension was not confined to the splanchnic area, but was generalized throughout the systemic circulation. They also found that the blood vessels are capable of considerable dilatation and the increased resistance is due to a hypertonic state and not to organic changes in the vessel walls. They concluded that this hypertonus is not of vasomotor origin but is, in all probability, an intrinsic spasm of the blood vessels themselves. These conclusions apply to all the types of hypertension—namely, benign, malignant and the so-called renal hypertension, which is associated with acute and chronic glomerulonephritis and chronic pyelonephritis. They conclude that normal vasomotor activity is superimposed on intrinsic vascular hypertonus. Their opinion is that surgical procedures aiming at the relief of high blood pressure, by sympathectomy, do not abolish the vascular hypertonus which is fundamentally responsible for hypertension.³⁵

Chemoprophylaxis of Poliomyelitis: Schultz and Gebhard make a progress report on the prophylaxis of poliomyelitis by the treatment of the nasopharynx. It is recognized that the olfactory nerve is the portal of entrance of poliomyelitis virus. They studied a number of solutions and their conclusion was that 1% picric acid in physiological saline was the most suitable, for two reasons—first, because its effectiveness, in protecting the mucous membranes from invasion by the virus, has been established and, secondly, because it is harmless and non-irritating. They suggest that the solution be applied by means of a spray on three successive or alternate days and thereafter once every week or ten days during the period of an epidemic. Since the solution should be thoroughly applied to the olfactory area, it is desirable to have the treatments carried out under the supervision of a competent physician, preferably a nose and throat specialist, who would consider the anatomic conditions which might ordinarily interfere with making the necessary contact with this area.²²

Peptic Ulcer Therapy: Kellogg and Mettier of San Francisco report their conclusions in a study of secondary anemias due to prolonged bleeding in peptic ulcer. They present data on the influence of alkalinization of the gastro-intestinal tract on the regeneration of blood by dietary iron. They found that the bone marrow failed

to respond to the ingestion of dietary iron while the patients were undergoing alkaline therapy and on withdrawal of alkalis increase in concentration of hemoglobin occurred. Increase in the number of erythrocytes and reticulocytes occurred soon after the addition of iron rich diet to the alkaline régime. They conclude that alkalinization of the upper part of the gastro-intestinal tract interferes with the utilization of dietary iron for the synthesis of hemoglobin, but not with the utilization of material necessary for the formation of the cell structure.²³

Acne and Carbohydrates: Crawford and Swartz of the Harvard University Medical School, offer a very interesting observation on carbohydrate metabolism in acne. Their conclusions are that the previous general belief that carbohydrate metabolism is a factor in the production of acne vulgaris furunculosis is fallible. They found patients with acne furunculosis have low blood sugars and normal dextrose tolerance tests—they improved on diet high in carbohydrates and intravenous dextrose injection. Fifty per cent of their patients showed definite improvement—twenty per cent slight improvement and none were worse. The results of their experiments intimate that a high carbohydrate diet is not inimical to the welfare of patients with acne, but other types of foods, or perhaps specific foods, are more to be incriminated as factors in cases of acne than the long abused carbohydrates.²⁴

New Methods Of Medical Treatment Of Schizophrenia: L. De Meduna of Budapest, Hungary, reports very interesting and apparently excellent results in favorably altering the course of schizophrenia by artificially producing epileptiform convulsions. Convulsions were produced by intramuscular injections of twenty-five per cent oily solution of camphor, gradually increasing the dose from eight to thirty cubic centimeters. Metrazol in ten per cent solution intravenously, in doses from three to six or seven cubic centimeters was also used. The short duration of the experiments (one year) has prevented him from drawing far-reaching conclusions. He states that some of the cures may be due to incidental spontaneous remission. However, he emphasizes two points—first, that the percentage of cures that he has obtained far exceeds the number of spontaneous remissions recorded in the literature and, secondly, there were relapses in which the prompt application of convulsive therapy lead to remission on the day following the convulsion.²⁵

Hypoglycemic State In The Treatment Of Schizophrenia: Bernard Glueck of Ossining, New York, reports the results of deliberately induced hypoglycemic state in insulin shock in the treatment of schizophrenia. This form of therapy was introduced at Professor Potzl's Clinic in Vienna in 1933, and since has been extensively employed in private and public mental hospitals in Europe. He reports a group of seventy-five patients of which forty-eight per cent achieved a complete recovery—total failure occurred in eighteen of the seventy-five cases. In the remaining twenty-one, definite improvement was noted.²⁶

Recent Advances In The Study Of Viruses And Virus Diseases: The reviewer recommends to those interested in this subject, which is one of great importance and significance, that they take the time to peruse and study the article by Thomas M. Rivers of New York, published in *The Journal of the American Medical Association* of July 18th—volume 107—pages 206 to 210.

Dr. Rivers discusses at length the recent advances in knowledge concerning all types of virous diseases and discusses the status of vaccine and serum therapy in these conditions. The article is of such a nature that it is difficult to abstract in a short paragraph.

Diseases Of The Ductless Glands: The relationship of endocrinology to general medicine has been increasing in interest by leaps and bounds the past several years and 1936 has contributed some very momentous advances in the study of the endocrines. The development of the knowledge regarding the hormones of the pituitary and ovaries is well known for the revolutionary effect they have had upon the treatment of gynecological lesions, especially ovarian dysfunction and dysmenorrhea. The advances in the addition to our knowledge of the thymus and pineal glands, as they are being worked out by Adolph M. Hanson, of Faribault, Minnesota, offer some very interesting possibilities in their application to medical problems. Dr. Hanson states that the thymus glands of young milk-fed calves, up to four weeks of age, and killed within six hours after the last feeding, are particularly rich in an iodine reducing substance which is most likely glutathione. Glutathione consists of three amino-acids—glutamic acid, glycine and cysteine. Glutathione injected into rats in similar proportions to the amounts of iodine reducing substance in thymus extract, Hanson estimated, as glutathione, reveals the same biologic effect. It seems that one function of the thymus may be that of supplying large amounts of glutathione in early life to care for the demands of rapid growth and development and possibly to take care of the normal cell growth and repair by smaller amounts later in life.²⁷

Hanson also states that pineal extract, when injected intra-peritoneally, in succeeding generations of white rats of the Wistar strain, produces dwarfism, physical an sexual precocity. While it retards and limits body growth, it speeds up development, the gonadal development compared with the size of the animal being outstanding.

PROTAMINE INSULIN: The development of protamine insulin is perhaps one of the greatest advances that has occurred in medicine during the past year. It was discovered by Hagedorn of Copenhagen. This insulin compound is absorbed slowly due to the fact that it is combined with a basic substance, the protamines. Hagedorn used the monoprotaamines obtained from the sperm of the rainbow trout. When the reaction of this protamine insulin was adjusted to a P^H of 7.3, a precipitate took place. This substance was of constant insulin concentration and when injected into the body there was a steady and prolonged absorption of the insulin. The use of protamine insulin makes it possible

for the average diabetic to receive but one injection of insulin a day. The insulin is gradually absorbed, and its effect from one injection has been observed for as long as fourteen hours. Hagedorn's results have been confirmed by numerous observers in this country. One to five days are necessary for the average patient to change from regular to protamine insulin. To accomplish the use of one insulin dose a day, it is advisable to give a dose of regular insulin, plus a dose of protamine insulin, before breakfast. In changing from the regular to protamine insulin the same number of units of regular insulin are given before breakfast, combined with an amount of protamine insulin equal to the quantity usually given during the rest of the day. Insulin reactions may occur with protamine insulin and careful adjustment of the dosage of protamine insulin must be made. Reactions, however, are usually milder than with regular insulin.

With the recent preparations of American manufacturers, to which zinc or calcium has been added, the action is prolonged for more than twenty-four hours. These preparations do not vary as much in effect as those without the zinc or calcium and they can be kept without deterioration for several weeks. At this writing protamine insulin is not available on the market but will be soon.³³

CRYSTALLINE INSULIN: M. Paul Mains and McMullen of Chicago give an excellent review of the subject "Crystalline Insulin as Developed by Dr. Melville Sahyun of Detroit" and confirm Dr. Sahyun's observation. Regarding potency, crystalline insulin is fully as potent as the regular type. With both types of insulin equally as potent, any difference in their actions is to be attributed to differences in their rates of absorption. During the entire course of the investigation only five instances of insulin reactions were noted, and in none of them did the patient become comatose. They report one individual who had frequent reactions with regular insulin, coma coming on almost immediately and before he had time to summon aid or take carbohydrates. These disappeared on the administration of crystalline insulin. The apparently slow onset of hypoglycemia with crystalline insulin is a distinct advantage, inasmuch as it allows the patient time to ingest carbohydrates and thus prevent coma. None of the other patients required any treatment for their hypoglycemia, the reactions being very mild. One of the characteristics of crystalline insulin is the delayed absorption—for instance, a dose given before breakfast is absorbed so slowly that the blood sugar is not lowered until 11 A. M. and the blood sugar for the remainder of the day is maintained at a fairly constant level. The rate of absorption of crystalline insulin is dependent on some factor in the body, possibly the P^H . The advantages of crystalline insulin are summarized as follows: it is stable at room temperature; it is equally potent with regular insulin; it shows slower absorption and a more prolonged reaction than ordinary insulin. Severe infections, or acidosis, favor a more rapid absorption. Delayed absorption prevents insulin reactions, even when the fast-

ing blood-sugar is low. A single morning dose remains in effect during the succeeding night. One daily large dose of crystalline insulin will control the blood sugar of patients usually requiring two or more doses of regular insulin daily and maintain the patient aglycosuric.²⁸

PERNICIOUS ANEMIA: The continued study of pernicious anemia has resulted in some progress in the refinement of liver extract and the discovery of its presence in other organs besides the stomach and liver. Unto Uotila of the University of Helsinki²⁹ made preparations from the lowest part of the small intestines, just above the ileocecal junction. The effect of extracts obtained from the ileum was about fifty to sixty per cent, calculated according to the reticulocyte reaction, of that exercised by dry stomach powder.

Schemensky, of Kustrin, Germany, reports treatment of pernicious anemia with powdered colon of hogs with excellent results.³⁰

In recent experimental work on the etiology of pernicious anemia, Wakerlin and Bruner, of the University of Louisville, have found evidence of the anti-anemic substance in human urine. Their work consisted in the injection of specimens of urine from six normal subjects into pigeons and the reticulocyte response observed. Their results indicated that significant increases in the reticulocyte percentage occurred following injection of small doses of urine. Other workers have reported erythropoietic activity of normal urine when administered to rats and guinea pigs.³¹

Efforts to determine the chemical nature of the anti-anemic principle have not met with definite success, although progress has been made. Julius Schultz, of Ann Arbor, Michigan, concludes that previous to 1935 it was believed the anto-anemic principle had a nitrogenous base. Dakin has since shown that it perhaps is a gluco-

samine peptid derived from some mucin-like substance. Further progress will be made more rapidly in the future when better methods of testing products are found.³²

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A Review of 1936 Literature on Obstetrics and Gynecology*

By

P. R. Billingsley, M. D., F. A. C. S.

Sioux Falls, South Dakota

IN THE preparation of this review of current literature, the limitation of space has been kept in mind, and an endeavor has been made to choose those articles which seem to have the greatest practical importance. Such a plan of necessity passes by many reports which may later prove to be invaluable, but which at present only seem to have an academic interest.

Obstetrics

The determination of sex by the method of Dorn and Sugarman (evidence of spermatogenesis in the testes of immature male rabbits when injected with the urine of pregnant women) has been investigated by Mathieu and Palmer, and by Pommerenke and Rogers, both reports

showing an inability to confirm this work. Schumacher critically evaluates all the theories of sex determination that have been advanced from Galen to date, to show the weakness of each, and to leave the question in *status quo*.

In the matter of prenatal care, there are several papers which discuss the effect of diet upon mother and child and upon the course of the pregnancy, all of which seem to emphasize the importance of a widely-generalized menu which will automatically insure an adequate vitamin intake, rather than a rigid insistence upon certain specified foods. In general, these papers assert the value of a wide variety of food, plus milk (or medicinal calcium), plus cod liver oil.

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The not uncommon occurrence of biliary colic during pregnancy gives interest to a report by Reigel, Ravdin, Morrison, and Potter. The gallbladder bile of 34 women at term was analyzed, the cholesterol concentration being usually increased, and the bile salt concentration being invariably decreased. These findings are what would be expected in the early stages of calculus formation.

Observations on the period of pregnancy by Obata would indicate that 280 days, or thereabouts, is the exception. In 10,000 pregnant women at his hospital, pregnancy ran from 264 to 297 days, with only 3.8 per cent delivered in 280 days. Among 30 women who had a definitely known date of conception, pregnancy continued from 233 to 288 days.

The Ascheim-Zondek reaction as a test for pregnancy is the subject of several papers. The production of ovulation in immature female rats and female rabbits and the production of follicle rupture in mature female rabbits (Friedman) are the methods commonly used. Davy and Sevringhaus had an accuracy of 90% in 425 cases, the 10 per cent of inaccuracy representing both false positives and false negatives. The cause of error was rarely a matter of technique or of interpretation, but is felt by the authors to be inherent in the test. Much better results are reported by Hansen and Gram in a series of 997 cases, with an initial inaccuracy of 1.48 per cent. Mills reports 213 cases (using the Friedman modification) with an inaccuracy of 3.3 per cent. In all of these reports an analysis of the failures will usually show some form of pelvic pathology in the mother (uterine and ovarian tumors and infections), while it is less frequent to find fetal pathology as a cause. On the other hand, the test may remain positive for as long as three months after death of the ovum. A further report on the value of the ovipositor change in the female Japanese bitterling as a test for pregnancy showed four failures in 31 tests. Another report concerning this method gave 12 failures in 21 tests known to be pregnant, was positive in 4 of 7 non-pregnant women, and was also sometimes positive in the male and after the menopause. All of which emphasizes the need for correlation between the clinical and laboratory findings.

Those papers which deal with the X-ray diagnosis of obstetric problems are chiefly concerned in sounding a note of warning against relying too much on this method of determining disproportion, or of making a diagnosis of a fetal monstrosity.

The treatment of habitual and threatened abortion is considered by several writers, and while the number of cases is necessarily small, they give renewed emphasis to the probable value of thyroid extract and lutein hormone (corpus luteum, progesterin) in prevention. In the treatment of the various types of abortion in progress (incomplete, septic), there are reports of large series of cases from Milwaukee, Boston, Birmingham, and Emory University, in which a conservative regimen was followed, with a good deal of reliance on the newer ergot preparations as a means of emptying the uterus,

and employing digital or instrumental curettage only after other methods failed. These reports offer low mortality figures as further argument in support of conservatism in treating abortion, an attitude which would seem to be gaining in its general acceptance. On the other hand, Carroll offers an interesting report of 106 cases of abortion (all types) which were treated by emptying the uterus at once and inserting carbon in the uterine cavity, with a shortened convalescence, lessened toxemia, and no mortality.

The matter of therapeutic abortion comes up for discussion in several papers, as it relates to tuberculosis, heart disease, nephritis, the toxemias, and neurologic and psychiatric disorders. Without attempting a critical evaluation of these papers, it can nevertheless be said that this most vexsome problem is about where it has been for some time, with the emphasis placed upon conservatism in the borderline cases, but with renewed insistence upon the need for radical interference in a small minority of cases of severely advanced disease. But each case is an individual problem without any precise rules for guidance. DeLee offers a critical comment in which he states that in general he has not receded from the radical stand he took many years ago with regard to tuberculosis. As to the technique of therapeutic abortion, a paper by Robinson and others testifies to their failure to induce labor by the use of estrin when the fetus was alive, though they report 80 per cent efficiency in cases of death of the fetus, or missed abortion. A hopeful field of use for estrin is in uterine inertia, where the response is often quite dramatic.

The various writers who have discussed the relationship between various types of acute and chronic heart disease (apart from the question of therapeutic abortion) have been insistent in speaking of the desirability for a closer cooperation between the obstetrician and internist in the management of these cases during pregnancy and in labor. Every effort should be made to build up cardiac reserve during the pregnancy by enforced rest, the use of sedatives, digitalis, *etc.*, and when the test of labor comes one should draw upon this reserve as little as possible. Little can be done to shorten the first stage of labor, nor is there any great need for this, since it is a period of little muscular effort on the part of the patient. But a good deal can be done during the second stage of expulsion to lessen the cardiac effort by the use of anesthesia (local and general), episiotomy, and the application of forceps. However, if there is a grade of decompensation that does not justify labor, then a solution of the problem can be found in low cervical section done under local anesthesia.

A distinctly optimistic viewpoint of the effect of pregnancy on pulmonary tuberculosis is taken by Ornstein and Kovnat. A 33 per cent mortality in a non-pregnant group was only raised to 36 per cent in a group of pregnant women, this increase being almost entirely in the caseous-pneumonic type of the disease, rather than in the chronic productive type.

An outstanding discussion of the problem of diabetes and pregnancy is contained in an article by White, who analyzes the material in Joslin's clinic, consisting of 257 pregnancies in 180 women over a period of 36 years. The low maternal mortality of 5 per cent before insulin was unchanged by the advent of insulin. The hazard to the mother seems to lie mostly in the fields of toxemia, eclampsia, and a lowered resistance to any infection which may ensue as a result of operative interference. The use of insulin has definitely increased the rate of fertility among diabetic women and has lessened the symptom of amenorrhea so many of them have. In contrast to the low maternal mortality, there is a very definite increase in the rate of abortion and stillbirth among these women, despite the use of insulin.

Irving suggests that the hypochromic anemia of pregnancy is due to a depletion of the iron and copper reserves of the mother, due to the demands of the growing fetus. An interesting corollary to this theory is the statement by Strauss that infants born to mothers with hypochromic anemia do not have a similar anemia at birth but are prone to develop it during the first year of life.

Traut and Kuder offer an explanation of the upper urinary tract infections occurring during pregnancy. The idea that the gravid uterus presses upon and hinders the free flow of urine is not sufficient by itself, for an analogous situation does not develop with uterine fibroids and cystic ovaries. But when this factor is combined with the atony of the ureteral musculature and the ureteral dilatation that they have observed, they arrive at a reasonable explanation for the incidence of infection in the poorly-drained renal pelvis. They advise rest, large amounts of fluid, and the use of alkalis, when combined with frequent changes of posture from one side to the other in order to favor drainage of the kidneys. To all of this Harris recommends the more frequent use of ureteral catheterization, not so much for the relief of the present situation as for the prevention of permanent damage to the kidneys. He allows the catheters to remain *in situ* from four to six days. Trillat advises the use of autogenous vaccines in this condition.

What to do with the fibromyomatous uterus in pregnancy is discussed by three writers. Studdiford and Mahon take the view that only rarely do they complicate delivery, and hence are best left alone unless some critical accident occurs, such as obstruction in labor, or an acute degeneration in the fibroid. A more radical view may be taken in the elderly patient where hysterectomy might be considered at the end of the childbearing age. On the other hand, Rehmann feels that all such conditions should be operated upon in the presence of symptoms which others might regard as of minor significance, even though operation may cause abortion.

There are several papers which deal in a statistical way with the incidence of gonorrhea in pregnancy, and with the frequency and nature of the complications that may develop in mother and child as a result of this disease. The main emphasis is in the direction of ade-

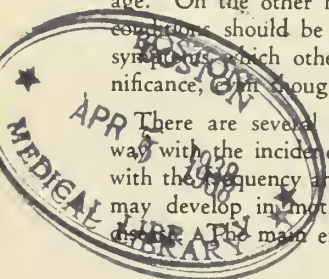
quate prenatal care and treatment, stressing the need for repeated and critical examinations in all suspected cases.

Mathieu and Palmer report on the surgical cure of two cases of chorionepithelioma. In each there was a history of the passing of a hydatid mole two and three months prior, and in each case the diagnosis was warranted by the finding of anterior pituitary-like hormone in the urine through the use of the Friedman test. Brindeau and others make a report on 27 cases of mole, in 4 of which chorionepithelioma developed. They do not feel that the persistence of pituitary-like hormone (Friedman test) in the urine is pathognomonic of malignancy following a mole, but they do place much faith in failure of the luteinizing hormone to disappear from the blood. They run frequent titrations for this substance for some time after expulsion of a mole, and if it does not show a decreasing curve, a diagnosis of chorionepithelioma is made. In the four cases they report the diagnosis was confirmed microscopically.

As noted above, the treatment of abortion has varied from time to time, but at present there is a definite trend toward conservatism. A problem of surpassing importance which has plagued the obstetrician in like manner is that of the management of eclampsia. The pendulum has swung from radicalism to conservatism and back again, just as in abortion; but it can definitely be said at present that some modification of the conservative Stroganoff régime seems to offer the best outlook for these patients when viewed in the cold light of mortality figures. As usual, the literature of the past year brings out many papers dealing with this problem in its many phases of etiology, pathogenesis, and treatment; and it is impossible to discuss them all in a critical way. Nor is it necessary to recite the general principles of conservative treatment by the Stroganoff method. Various writers have reported their varied experiences during the past year, and have outlined their own individual modification of the method. All agree on the value of rest, freedom from stimuli, and the use of morphine or other sedatives, plus catharsis, accurate control of fluid intake, and a careful study of the blood chemistry and renal function as a factor in prognosis and in the determination of an opportune time for the induction of labor.

When it becomes imperative to secure the termination of labor (either because of an unfavorable trend of events during the pregnancy, or because of the onset of convulsions during the labor), there can be little doubt that a conservative method of vaginal delivery is superior to abdominal section. The colpeurynter is of great value in starting labor and of great value in hastening dilatation when labor has started, and can be followed by episiotomy and version or forceps as a means of shortening the second stage. In some cases, vaginal hysterotomy may well be the best method of delivery. All of this is a generalization of what the writer feels is the trend of opinion today.

More specifically, some interesting things are noted. The "cold test," as devised by Hines and Brown, has been



used by Randall and others at the Mayo Clinic in 104 cases, as an index of liability for the development of toxemia. A normal blood pressure reading at rest is first made, the other arm immersed in water at a temperature of 5° C. for 60 seconds, followed by two-minute blood pressure readings till normal is again reached. A prolonged elevation of pressure may indicate susceptibility to toxemia. And there is a report by McGee on the use of ephedrine in controlling convulsions. Paradoxically, the ephedrine seems to help in affording a compensatory elevation of blood pressure, which has been previously depressed by the use of barbiturates. At the Cincinnati General Hospital there have been 121 consecutive cases of eclampsia treated with veratrum viride, with a mortality of 9.92 per cent. And finally, there has been some interesting theorizing on the origin of eclampsia. In a normal patient, there is a fall in the prolactin and a rise in the estrin during the last trimester of pregnancy; but in toxemia these figures are reversed and there is a persistence of the high prolactin figure. These observations may be correlated in some way with what has been noted in microscopic examination of the pituitary of eclampsia patients, in that there is a proliferation of basophile cells in the posterior lobe. This in turn may be linked-up with the development of pressor substance from the posterior lobe.

Practically all of the foregoing notes refer to questions that come up during the period of pregnancy. The matter of labor is now to be discussed.

Caldwell and others at Columbia have studied the mechanism of engagement and rotation by means of stereoscopic films. They conclude that a primary transverse position at the beginning of engagement is most common, and primary anterior and primary posterior positions less so. They also conclude that the fetal head is not usually perpendicular to the plane of the inlet (synclitism), but lateral flexion is more the rule (giving asynclitism, with the posterior parietal bone presenting). They think that rotation is accomplished by the uterine contractions imparting a spiral movement to the fetus as it slips over the angle formed by the uterine wall and the slope of the pelvis.

A simple method of measuring the true conjugate is offered by Weitzner. A metal ruler is placed perpendicularly over the sacrum and is included in a film made in the lateral position. The length of the conjugate can then be laid over on this ruler and read directly. Ball and Marchbanks have devised an instrument with a chart which traces directly the X-ray outlines of the fetal head and pelvic inlet, and lets one read directly their respective circumferences.

There have been several conflicting analyses of labor in young women and old women, and also comparisons between primiparas and multiparas. These reports seem to indicate that there is an increased fetal death among the multiparas, and a greater maternal hazard in the young primiparas. But as stated, the reports are conflicting.

Obstetricians have always been interested in the probable cause of the onset of labor. With the development

of the newer knowledge regarding the pituitary and its control of ovarian function, there has been some stimulating theorizing carried out in this field, and some experimental work also. But it is not yet clear what the relationship may be between the pituitary (posterior lobe pressor substance), the anterior pituitary-like substance in the urine of pregnant women, and the ovarian hormones (estrin and progesterin) insofar as initiating labor is concerned. Suffice to say, there is good clinical evidence that estrin is of value in starting pains when the fetus is dead (as in the treatment of abortion), and estrin is of value in uterine inertia.

There is recent and renewed interest in the function and value of the bag of waters in labor, and a number of papers have been written on this subject. There are five major objections to early rupture of the membranes: injury to the fetal head, prolapse of the cord, infection, cervical lacerations, and prolongation of labor. Most of these articles seem to minimize the importance of these objections, and particularly stress the fact that labor really seems to be shortened thereby. DeLee criticizes these papers from the main viewpoint that the bag protects the child's head. Those of us who have had the unpleasant experience of taking care of intracranial birth injuries will probably sympathize with his attitude.

Anesthesia and analgesia in labor deserve more than a passing paragraph; but the question has been well answered by someone who has remarked that the ideal reagent has not yet been discovered. The second stage of labor, now and for a long time past, has been well taken care of by some form of inhalation anesthesia; but we have yet to secure acceptable results during the hours of dilatation. Testimony to this effect is found in the great number of reports during the past year, most of which deal with the various types of barbiturates. Some investigators have modified the original Gwathmey method by using a barbiturate in place of the morphine (but continuing the rectal administration of ether); and others simply use the barbiturates alone, supplemented by inhalation anesthesia. One report deals with dilaudid and scopolamine. It is difficult to look over these reports and feel that any one method stands out as superior to all others. The most valid objection to the use of the barbiturates (aside from their relative failure to produce amnesia and analgesia), is the fact that they produce excitation, restlessness, and unruliness in some people, and demand greater watchfulness than is the case with the Gwathmey method as originally developed.

In the field of operative obstetrics there are interesting papers on funnel pelvis, fibroids in labor, rupture of the uterus, the treatment of posterior positions, and forceps. But Caesarean section occupies the center of interest, and here again only a summary of trends can be discussed. There are numerous reports from large obstetric clinics, statistical in nature, which record gratifyingly-low mortality figures. And in these reports the operative indications are restricted and rigid in their application. But in the general surgical field, which still comprises the larger fraction of cases, there is still too much latitude in the indications and too large a

mortality figure when the results are tabulated. Ideally, this whole problem should be in the hands of the obstetrician; but such an objective is still a long way off, and until that millenium arrives it will be necessary for the surgeon and patient each to guard against the ease with which this operation may be done. A second pertinent observation is this: that there is a definite tendency to adopt the low cervical section as the method of choice. The general surgeon is still performing the classical operation, but the obstetrician and gynecologist is turning toward the somewhat more difficult cervical operation as the method of choice. A third thing to be noted is that the treatment of placenta praevia has been slowly changing in the last twenty years, and to an increasing degree is Caesarean section being done for this condition.

Infection is still the most important question in the puerperium. There are interesting papers to be read but there are no outstanding contributions to our knowledge of this disease. Stout at Johns Hopkins has analyzed the incidence of infection in the home as contrasted with the maternity hospital, and concludes that the home is twice as dangerous as the hospital. Watson emphasizes a three-fold need, in the detection of carriers, the use of masks by the attendants, and the isolation of infected cases. Lash at the Cook County Hospital discusses treatment and urges especially the value of blood transfusions and the early use of anti-streptococcic serum. Colebrook, on the other hand, believes that such serum may possibly have harmful effects upon the patient in disturbing her own immunizing processes, and advises conservatism in its use until there is better evidence in experimental animals that streptococcic infections are helped by its use.

Gynecology

In the preparation of the above notes on obstetrics an attempt was made to limit the material to those subjects that have the greatest practical interest, since obstetrics is still in the hands of the general practitioner to a large extent and will probably remain there. In the field of gynecology it would seem even more important to choose only a few subjects for review, and those that are connected with general practice.

The field of endocrinology as it relates to gynecology has been productive of more papers than any other subject in the past year. For the student, attempting to orient himself in this maze of information, there are two chief difficulties. The first is that the entire problem is in process of development, and hence there are many conflicting reports and conclusions, and one is at a loss to know what is authentic. The second is the matter of terminology. As always, uniformity of names is the last stage in development. To assist somewhat in helping one over these humps, it may be well to condense some abstracts which have appeared in the *Year Book of Obstetrics and Gynecology*.

"The bisexual gonadotropic hormone which activates the ovaries and testes, has been demonstrated by R. T. Frank in the blood and urine. Before puberty, small

amounts of this hormone are noted in the blood and urine of children and adolescents. The hormone brings about the trophic growth of the genitals. At puberty, greater amounts are demonstrable, causing full activation of the sex glands. In the healthy adult female a cyclic activity of the prepituitary lobe is manifested by the cyclic blood and urinary curve obtained. After impregnation and throughout pregnancy an increase of from 100 to 200 times the amount found in the non-pregnant woman is noted in the blood and urine. At the menopause the prepituitary cycle ceases. In one group (50 per cent) a permanent increase of a gonadotropic hormone is noted in the blood and urine; in the other, none is demonstrable. No clinical differences in these persons are noted. Functional diseases of the female genital tract appear due to disturbances of the prepituitary cycle. With present methods this cannot always be demonstrated by blood and urine hormone studies. In the male there is no evidence of a prepituitary cycle or of a senile condition corresponding to the menopause.

"The female and male sex glands produce distinctive hormones, which have been recovered from the blood and urine. A substance apparently identical with the testis hormone is found in the female; estrogenic substance is found in the male.

"In the normal, mature, fertile woman, two hormones are secreted by the ovary: the estrogenic factor, which circulates each month in increasing concentration in the blood stream until the onset of menstruation, with a typical urinary curve of excretion, and the progestational factor, as yet not demonstrated in the blood but found cyclically-distributed in the urine. In pregnancy a higher level of the estrogenic factor is noted in the blood after the eighth week, and a disproportionately greater increase in the quantities excreted in the urine (placental effect).

"Normal genital function in the female is dependent upon synchronism of prepituitary, estrogenic, and progestational blood cycles (with corresponding, characteristic excretory curves). Functional diseases, as has been shown by blood and urinary studies, are due either to underfunction or overfunction of the ovaries. Disturbances of function in most instances are primarily referable to disturbances of the prepituitary cycle.

"The testis hormone has been demonstrated in the blood and urine. No cycle has been found, and little correlation between male functional diseases and changes in the humoral balance as yet has been discovered. Organic disease in the male can produce changes in the excretion of gonadotropic principle."

Further explanation of some of the above statements can be found in another quotation.

"There is a group of estrogenic substances which may be subdivided into those active in castrates, and those active only in animals with intact gonads (gonadotropic substances). The latter group may be subdivided into those of pituitary origin and those of placental origin. Some or all of these are found to occur in pregnancy blood and urine, the placenta, the ovary, and the pitui-

tary. In addition to these, there is in the female the luteal hormone, a product of the ovary; and in the male, the testis hormone, presumably a product of the interstitial cells of the testis.

"Although different forms of estrogenic substance have been obtained in crystalline form, it is a fact of special significance that the bulk of estrogenic substance in fresh urine occurs in some organic combination, as yet unknown. Gonadotropic principles that have to be considered are (1) the maturity hormone complex of the anterior lobe; (2) the anterior pituitary-like gonadotropic hormone of placenta, pregnancy blood, and urine; and (3) an anterior lobe product found in the urine in certain menopausal states, in the urine of castrates, and occasionally in normal urine.

"Since discovery of the gonad-stimulating factor called 'prolan' in pregnancy urine by Ascheim and Zondek, there has been much discussion as to whether this substance is identical with the anterior lobe product, and, if identical, whether the hormone found in the placenta, blood, and urine is produced by the anterior pituitary or is produced also by the placenta. Results of experiments in hypophysectomized rats show that the anterior pituitary-like factor cannot replace the real anterior pituitary substance.

"It has been proved by Zondek that the urine of castrates and of women in the menopause may contain the principle which Zondek calls 'prolan A.'

"It seems necessary at the present time to postulate two hypophyseal hormones (gonadotropic), one that stimulates follicles and one that luteinizes the theca and mature granulosa."

While all of the above may seem more theoretical than practical, nevertheless it is being reproduced here, for only by an understanding of these theories can one trace a path through all of the assertions that are being made regarding the hormonal treatment of obstetric and gynecologic problems.

There have been many reports which deal with carcinoma of the uterus, most of them concerning cervical carcinoma. Several writers have again discussed the rôle that trauma plays in pathogenesis, and again make a plea for the adequate treatment of the lacerated cervix, chronic endocervicitis, and the so-called cervical erosion as a preventive measure. Some attempt has been made to link up pituitary function with the production of cancer because of the twin facts that the pituitary secretion can produce changes in the cervical mucosa in experimental animals, and because 80 per cent of genital cancers show anterior pituitary-like hormone in the urine, whereas extragenital cancers show no such hormone; but so far it is felt that these facts express a secondary relationship.

As to diagnosis, several points need emphasis. The development of the colposcope in the hands of the specialist has proved a distinct aid in the early diagnosis of suspected lesions. Good visualization, in magnified form, afforded by this method, will serve to at least make us suspect malignancy earlier than heretofore. And the observation that carcinoma cells do not con-

tain glycogen, and therefore will not take an iodine stain, should make the general practitioner more alert in using this simple test. Warning is given, though, that this test is not infallible, and there can be false negatives and false positives. The admitted fallibility of the iodine test and the colposcope will then serve indirectly to emphasize the paramount importance of microscopic examination in all suspected lesions.

In treatment, there seems to be general agreement in that trend of late years which places radiation with radium at the front in treating cervical carcinomas, whereas radiation and surgery combined offer the best chance in adenocarcinoma of the fundus. By corollary, several writers have discussed the desirability of total hysterectomy for benign pelvic pathology, as compared to subtotal hysterectomy, the argument being advanced that the remaining cervical stump in the latter operation offers an increased incidence in the development of carcinoma, and this fact more than offsets the slightly higher surgical risk that is inherent in the complete operation. But this seems to be largely an opinion with few statistics to back it up. A most comprehensive report comes from the Marie Curie Clinic in London. A total of 728 cases in 10 years is analyzed. Five hundred of these could be classified histologically as to the degree of malignancy. It is an interesting fact that the rate of local cure for three-year survivors did not show more than a 15 per cent variation between the various groups. In all cases radium was used, and in only a very small proportion was supplementary X-ray radiation used. The second important conclusion is that there was an 88.8 per cent cure in the 90 cases which could be called operable or borderline. Of the 500 cases classified, 10 per cent were adenocarcinoma. A. Lacassagne (Paris) at the Fourth International Congress for Radiology stated that it still remains to be shown whether hysterectomy after intracavitary radiation is superior to radiation alone. That leaves the question of surgery still up in the air.

Possibly the two commonest menstrual disorders are dysmenorrhea and functional menorrhagia. Stone offers a note on the treatment of the former, and suggests that the proven value of cervical dilatation in a certain per cent of cases merits consideration, and recommends that the use of a No. 5 Hegar dilator in the office during the intermenstrual period be carried out. He states that the results are just as good as those following a more complete dilatation under anesthesia at the hospital. There are several reports dealing with the treatment of functional bleeding in young girls and at the menopause, with excellent results from the use of anterior pituitary-like substances. It is thought that the effect is obtained by a stimulation of the progestin factor, which has been inhibited by the prolonged action of the follicular hormone.

The rôle that the chronically-infected cervix plays in the production of pelvic and general disease is not definite; but most writers feel that there is a degree of causal relationship, and hence recommend that we attempt to clear up these infections. The widespread use

of the cautery prompts several reports, one of which stresses the value of fractional office treatments as opposed to a single hospital treatment in lessening the possibility of producing stenosis. The treatment of gonorrheal vulvovaginitis in children by the Lewis method is reported on by Miller (who used theelin) and by TeLinde and Brawner (who used amniotin). Both writers report over one-half of their cases cured, but there is a large percentage of failure. The latter writers believe that suppository medication is more efficient than by hypodermic use. Witherspoon at Tulane is unable to corroborate Lewis' reports of a large percentage of cures after a year's trial of the method, and feels that there is a further theoretical argument against the method in that the use of these substances may inhibit ovarian development later in life. Abramson reports good results in adult gonorrhea in treating 50 cases with ultra-violet light. Diathermy and fever therapy have been used by others with good results, and Sanders and Sellers at Tulane testify to the worth of the Elliott bag in treating adnexal pathology.

The conservative management of persistent adnexo-peritonitis is the subject of a report by Cooke at Galveston. The use of anterior and posterior colpotomy has given excellent results. Laparotomy had such a high mortality that it has been abandoned as a method. A few cases were treated by small multiple abdominal incisions and drainage where abscesses were close to the surface. Secondary operation through the abdomen, following several weeks after vaginal drainage, has likewise been abandoned because of the great technical difficulties, and because those that were not operated upon had a much better after-course. This report strengthens the growing feeling that here, also, conservatism pays dividends.

Trichomonas infections have been treated by an endless number of methods, which testifies to the relative value of all of these methods. An ideal method of treatment has not been found. Cornell calls attention to the need of examining the husband for prostatic infection in those cases which resist treatment or recur.

In those cases of sterility in which the question of the patency of the uterine tubes is to be investigated, the Rubin method of insufflation can be used, or an opaque oil and the X-ray can be used to visualize the tubes. Several reports call attention to occasional untoward events that may follow the latter method. These may be the introduction of infection, the escape of oil into the venous circulation, the production of an ectopic pregnancy, or the collapse and subsequent atresia of what was a normal tube. For these reasons the method should be used with caution (perhaps by the fractional method or Hyams). In most cases, the simpler Rubin method would seem to suffice.

It is impossible to read the various reports relating to contraception by the method based upon the theory of Knaus and Ogino and feel that this method is absolutely reliable. For example, Weinstock (in Germany) reports on observations made upon 416 women in whom pregnancy followed from a single coitus. He analyzes their menstrual cycles, and concludes that while there is a definite tendency for the fertile period to occur from the fifth to the tenth day of the cycle, yet this is only relative and experience indicates that there is really no sterile period within the menstrual cycle. This and other reports are so conflicting in their conclusions that one would do well to avoid endorsing "rhythm" control until our data are more reliable.

A Review of 1936 Literature on Surgery*

By

E. G. Balsam, M. D.

Billings, Montana

NO SUCH improvements or surgical departures as Harvey's discovery of the circulation, the work of Holmes, Semmelweis, Lister or Pasteur in asepsis or antiseptis, Long's or Morton's invention of ether, Halsted's use of rubber gloves or Roentgen's detection of the X-ray, have evolved through the past year. However, a multitude of smaller and less revolutionary, yet definitely progressive, changes have been apparent through a casual but comprehensive review of the surgical literature of the past year.

In the following pages is a compilation of the most significant articles, chosen because they reflect advancing concepts or practices in the field of surgery. Undoubt-

edly, many other papers deserve inclusion; and would have been included, were space not so limited.

General Considerations

Anesthetics: Cyclopropane or trimethylene was first prepared in 1882, and was first used as an anesthetic in 1929. Waters and Schmidt have reported favorably on its use in 2,000 cases. In extra-abdominal cases, they found only 13 deaths in 600 operations, whereas there were 23 in an equal number of operations when ether was used, and 22 in an equal number with ethylene. Size and his associates, during 1935 and 1936 at the Lahey Clinic, used it successfully in 184 cases. In 124 of these cases operative measures involved the chest. This appears to be the field to which cyclopropane is

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most applicable. Further, Wood reports good results in over 900 cases in which cyclopropane and fluid avertin were used.

Avertin, an intravenous anesthetic, was used 3,338 times at the Methodist Hospital of Indianapolis prior to October, 1935. Mueller continues to say that it is satisfactory for all types of surgery. The chief danger was respiratory depression which is combatted by an open airway, oxygen and carbon dioxide inhalations, caffeine sodiobenzoate and coramine. No deaths were directly attributable to the anesthetic. Gaudy and Wibaw discuss avertin principally in an article concerning 25,000 operations using intravenous anesthesia. They conclude that, as a result of its great margin of security, and its possibility of small and progressive dosage, surgeons should become more familiar with its use.

Antiseptics—After 16 months' observation and use of azochloramid, Goldberger found it highly successful in the antiseptic treatment of 351 cases of various types of surgical infection. Azochloramid is a chlorine compound with the chemical name N-N-dichlorazodicarbonamidine. Its marked stability should restore waning enthusiasm for the Carrel-Dakin technic of treating infected wounds antiseptically. Goldberger proved its stability with a potency titration test occupying one year's time. Young, of the University of Rochester, obtained excellent and, at times, spectacular results in the treatment of a large variety of surgical infections with azochloramid. Both the healing period and hospital stay were decidedly reduced and no significant or untoward reactions occurred. Azochloramid is slow to react with organic matter, remains available so long that dressings need be changed only once in 24 or 48 hours, and is probably least irritating of all chlorine compounds so far used.

New Instruments: Suture needles—Sheehan has devised a screw cap for the head of the needle. A strand of the suture is fitted firmly into the cap. Thus only a single thickness of suture passes through the tissue as it is sutured. The cap is discarded with the end of the suture when the suture is too short for use. Vogel threads his hypodermic needle with fishgut or a wire filament. With a stock of this wire in his hypodermic case and using a long morphine needle, he has sutured wounds more easily than with the ordinary surgical needle. The most elaborate invention was made by Nelson. It consists of a hollow needle and handle which has a wheel for propelling and a knife for cutting the suture. When the end of the material has been placed under the wheel in the handle and after the needle has been passed through the tissue to be sutured, the operator by turning the wheel forces the material out beyond the needle. Then, through grasping and holding the end of the material and by withdrawing the needle, the operator by pressing the knife can sever the material at any desired length.

Procedures: Ethylene Encephalography—Since 1919, air has been used to replace spinal fluid. However, re-

cently, ethylene has been used at the University of California in 100 cases. Brain tumors, epilepsy and the effects of brain injuries have been the pathological conditions principally involved. Ethylene has a mildly sedative effect on some cases, reduces hospitalization and is absorbed after a few hours.

Gastroscope—In 1932, Wolf and Schindler first perfected the flexible gastroscope now in use. However, it was not until the latter part of 1935 that Tucker invented the flexible forceps and perfected the technic for use in removing foreign bodies from the stomach. With the use of a sheathed flexible forceps dispensing with the previously used rigid open-end gastroscope, the patient can be placed in the upright or semi-upright position after the forceps is in position and gravity carries the foreign body to the greater curvature of the stomach where it is easily accessible.

Carey of the University of Minnesota states that the flexible gastroscope is the only instrument yet devised which gives a true picture of the living stomach in health and disease. It is his view that the gastroscope is not a substitute for roentgen methods, but rather, an adjunct to them. By direct gastroscopic examination many questionable diagnoses can be cleared up which otherwise would have to be established by repeated physical, X-ray or blood examination, or by exploratory laparotomy.

Large, Slow, Drip, Blood Transfusions—Believing that an anemic patient who needs a transfusion requires more than the usual 500 cc., Marriot and Kerwick, of London, increased the amount to an average of five pints. This amount was given by multiple donors and was administered by a drip method over an average period of 29 hours. General results were characterized as encouraging and some described as so dramatic and extraordinary that they appeared miraculous occurred in 87 such transfusions. In one case, 11 pints of blood were given over a period of 62 hours. In experiments with rabbits, Boycott and Oakley showed that there is little danger of overloading the circulatory system if massive blood transfusions are given slowly enough.

Needle (Aspiration) Biopsy—According to Ball, the diagnostic possibilities are much greater when the macroscopic and bacteriologic examination of the aspirated material is extended to include sectioning and staining of solid elements present. This method of obtaining tissue for biopsy has been used in every part of the body including prostate, bone, lung, breast, vertebral column and endometrium. The biopsy should be continued only until about two or three cubic centimeters of material are aspirated. Bits of tissue are teased from the blood clot and together are put in 10 per cent solution of formaldehyde for fixation.

Head and Neck

Eye—Modern treatment of retinal detachment, according to Arruga has completely changed the prognosis. Generally the surgical outcome is more favorable in young people as a result of the more rapid cicatrization. Of 300 cases reported by this author, 164 were cured. Kadlicky reports 25 successfully-operated cases

of detached retina in a series of 45 at the eye clinic in Prague. This author attempts not only to close the tear in the retina; but also to make a barrier between the normal and diseased retina by a series of electrocoagulation punctures. He uses a needle with a 2 mm. point which is bent at right angles. This needle is insulated with a rubber tubing so that only the bent point is free. The author devised an electrode of stainless steel to prevent oxidization.

Pharynx—Shallow describes a one-stage closed method for the treatment of pharyngeal diverticula. In a series of 76 such operations, there were only two deaths, and in 74 recovery was complete. None of the cases was complicated by mediastinitis and none required post-operative esophageal dilatation. Torek has said, "Thirty years ago the mortality was very high with the one-stage procedure, but in the last five years, 60 cases have been recorded with a mortality of only one."

Larynx—Garfin reports a study of 202 unselected and consecutive cases of cancer of the larynx observed at the Collis P. Huntington Memorial Hospital of Boston over 14 years prior to 1933. In the opinion of this author, surgical removal of the growth in the early, operative, intrinsic type offers a good chance of permanent cure. In certain types of not entirely operable tumors which are highly radiosensitive, the combination of surgery and irradiation has yielded good results. In far-advanced cases with metastases the author relies entirely on irradiation for temporary relief. Of 19 patients with proved cancer who were subjected to operation, seven are living and well, the longest survival being 15½ years, and the shortest, three years. Garfin concludes that if radiotherapy can be shown to produce as high a percentage of permanent cures as surgery, it will be a safer method of treatment than operation.

Esophagus—Eggers, in a concise article on technic, describes the different operations used for esophageal cancer. Under radical surgical treatment, he first describes the technic for treatment of carcinoma of the cervical portion of the esophagus. One healed case is shown following complete resection of the larynx, upper esophagus and hypopharynx. His second procedure is applicable to the thoracic portion of the esophagus and embraces both a cervical and posterior thoracic approach together with a gastrostomy connection to the upper esophageal stump. Finally, carcinoma of the lower esophagus is subjected to one of the following three operations described in this paper: (1) abdominal method of esophagogastrostomy; (2) transthoracic method of esophagogastrostomy; and (3) abdomino-thoracic operation.

Brain and Nervous System

Brain Surgery—An editorial in the July issue of *Surgery, Gynecology and Obstetrics* states that Mr. Cairns' study of 157 patients with verified intracranial tumors operated upon in 1926 and 1927 by Dr. Cushing, describes the condition of each patient seven to nine years after operation. Sixty-three patients were still

alive and 37 of those were living useful lives. The illuminating longest-known survival figures which Dr. Eisenhardt has added to Mr. Cairns' tables showing a four-year plus survival for a glioblastoma and a seven-year plus survival for a medulloblastoma, make one feel that a surgeon is scarcely justified in refusing operation because a tumor is presumably malignant and the surgical exposure is known to have a high percentage of postoperative fatalities.

On August 31, 1931, Dr. Gardner performed an excision of the right cerebral hemisphere according to a case report by O'Brien of Canton, Ohio. The patient's convalescence was indeed gratifying. She was able to return to her home and family, later to assume the duties of her household. The deformity existing prior to the operation, left hemiparesis, slight facial asymmetry and sensory disturbance, remained with her to the end. Her memory for recent and past events was good and she read constantly in spite of her eye difficulty. The sense of smell on the right side was lost, because the right olfactory bulb was destroyed. The sense of hearing in the right ear with the audiometer was undisturbed. She took the usual interest in her children, and attended very well to her household duties. She inquired about, and was anxious to know, all the details of her operation.

November 29, 1935, while about her home, she tripped and fell a distance of about 20 feet. She was able to get up and go about for a few days when she collapsed. In spite of temporary improvement from trephining, she was bedridden, decidedly apathetic, with involuntaries, and was aroused only with great difficulty, giving the appearance of one decerebrated. She died March 4, 1936. Five years of happiness with her family were provided this patient through removal of the right cerebral hemisphere. This is the longest known survival of such an operation.

Facial Nerve Repair—Shambaugh remarks that Duel and Tickle have carved themselves immortal niches in otologic surgery through their operative treatment of facial paralysis. Concerning the technic, Duel and Tickle emphasize the necessity of meticulous asepsis. The nerve is exposed, beginning at the stylomastoid foramen and working up to the horizontal semicircular canal. In cases of Bell's palsy, the wound is closed at once. When a graft is inserted, a temporary bloodless field is obtained by normal saline at 120° F. Dental gold foil is placed over the graft, and perforated rubber tissue is placed over this to prevent the gauze's adhering; then the wound is lightly packed with gauze moistened in normal saline. Closure is permitted when suppuration has ceased. Galvanic stimulation of the paralyzed muscles for a few minutes twice a week helps to keep up the tone of the muscle. When a nerve graft is used, perfect facial expression can never be hoped for, although the result is far better than has been obtained by any other method. When the nerve is only decompressed with slitting of the sheath, a perfect result can be anticipated. While approximately 80 per cent of patients with Bell's palsy make a perfect, spontaneous recovery in four to

six weeks, in 20 per cent partial recovery occurs only after three to 12 months.

Sympathetic Nervous System—White, in discussing Raynaud's disease, points out that in his series of cases the recurrence of vasospasm completely vitiated the early postoperative improvement in four patients and caused reclassification of the others as only mediocre in results. Denervated smooth muscle remains sensitive to the circulating sympathomimetic hormones epinephrin and sympathin. Not only does smooth muscle remain sensitive, but it becomes hypersensitive. A lasting vasodilatation can be obtained only when adrenal secretion is abolished. Observations over a period of one and one-half years have demonstrated that the lasting increase of blood flow in the arm after this operation can be as great as in the leg. He also finds that in scleroderma and sclerodactylia, improvement of circulation has been followed by an arrest in the advance of the disease, and by an improvement in function of the hand. In the late stages of poliomyelitis, increasing the circulation of the paralyzed leg may be of value for two conditions: for trophic lesions and for increasing bone-growth in the legs. The author recommends sympathetic ganglionectomy only in the rheumatoid type of arthritis when it is desirable to improve circulation *per se* in the cold, moist extremities. Hyperhidrosis or excessive sweating of the hands can be stopped by sympathectomy. Lumbar ganglionectomy should be reserved for those rare instances of Buerger's disease in which, after the paralyzed peripheral nerves have regenerated, vasospasm again becomes a complicating factor. He believes that clinical evidence reported by Adson, Craig and Brown, by Page and Heuer, and by Peet, constitute fairly convincing proof that sympathectomy can cause a worthwhile reduction in blood pressure in certain favorable cases of essential and malignant hypertension. In conclusion, he brings out the fact that sympathectomy in Hirschsprung's disease of suitable types is consistently effective, but presacral neurectomy is not a sound method for improving the function of a paralyzed bladder. Sympathectomy for spastic paralysis is now conceded to be totally illogical.

One of Adson's recent papers discusses many other conditions in which surgery of the sympathetic nervous system is indicated. The relief obtained in dysmenorrhea from resection of the presacral nerves is the result of the interruption of nerve fibers carrying sensation of pain, vasomotor stimuli and motor stimuli to the uterine muscles. Patients who have spina bifida occulta with neurotrophic changes occasionally develop indolent ulcers of the soles. Lumbar sympathectomy has been employed very effectively in improving the circulation and healing the ulcers. Sympathectomy is indicated for angina pectoris when the patients present vasomotor phenomena, and when they otherwise would be compelled to continue medical treatment for years. Though numerous surgical procedures have been introduced for the relief of the pain of angina pectoris, such procedures are not indicated when medical measures are adequate.

Thoracic Surgery

Bronchoscopy—Increasing use of the bronchoscope is responsible for many advances in thoracic surgery. Myerson reports that more than 150 patients either known to have pulmonary tuberculosis or else strongly suspected of having this disease, have been examined with the bronchoscope by members of the otolaryngologic service of Sea View Hospital. This author's experience has proved that bronchoscopy is not only permissible, but at times necessary, and can be done on such patients without harm. As a rule, patients with acute tuberculosis should not be bronchoscope. Certain findings appear with relative frequency in tuberculous cases of long standing, such as fibrotic and cicatricial changes both within and outside the bronchi.

Bronchiectasis—According to Bohrer, four lobectomies were done for bronchiectasis; two boys aged seven and nine years, and two girls each 11 years old. He believes that children withstand lobectomy as well as, or better than, adults. Graham states that the opinion has grown steadily stronger in recent years that children with severe bronchiectases should be subjected to the operation of lobectomy for the double reason that they bear the operation well and may be spared a life of more or less invalidism. Operative mortalities have dropped to respectable figures in properly-selected cases. Overholt reports two cases of pneumonectomy performed for suppurative diseases of the lung living and well. Mason of England reports six patients suffering with extensive unilateral bronchiectasis treated by pneumonectomy. All of these patients were between the ages of seven and 18 years. At the time of publication of the report four patients were living and well.

Tuberculosis—Coryllos summarizes this surgery as follows: the principal surgical methods besides pneumothorax which are used to effect collapse of tuberculous portions of the lung are: intrapleural pneumonolysis, closed (Jacobaeus) or open; extrapleural apicolysis with packing or plombe; interruption of the phrenic nerve either temporarily (crushing) or permanently (avulsion); and thoracoplasty, partial or complete. Other procedures such as scalenotomy, thoracoplasty with packing (Casper), multiple intercostal neurotomy (Alexander), and pneumocavernolysis (Neuhof) are of secondary importance, if any. In the first rank of present-day collapse methods are pneumothorax and thoracoplasty. Other methods are to be used only to supplement them, and can never substitute for them.

Lung Abscess—Pulmonary suppurations, at one time considered hopeless, are now often cured by surgical treatment. Galli classifies them as (1) simple abscess, (2) fetid abscess, (3) chronic suppuration, (4) pulmonary gangrene, and (5) pulmonary abscess secondary to bronchiectasis. Medical treatment does not seem warranted, except possibly in the amebic form. Abscesses which heal under medical treatment are usually of the simple variety which may heal spontaneously. Pneumothorax is rarely beneficial; in fact, it may be very dangerous because a fatal empyema may develop. Phrenico-exeresis is of no value alone but may be of

aid in other surgical attacks on abscesses near the base of the lung. Thoracoplasty is of value, not in the treatment of the abscess, but in the attack on the bronchiectasis often secondary to abscess. Neuhof and Touroff report 37 operative cases of acute abscess of the lung. In these cases there was one operative death. Twenty-five show an end-result of complete recovery.

Diaphragmatic Hernia—Harrington states that the incidence of diaphragmatic hernia is no greater now than 20 years ago. However, at the Mayo Clinic 30 cases were recognized clinically, and 19 were treated surgically in the period from 1900 to 1925, and 197 cases were recognized, and 105 were treated surgically in the period from 1925 to 1935. The only type of diaphragmatic hernia that may be treated conservatively is hernia through the esophageal hiatus, in which only a small portion of the cardiac end of the stomach is involved. In 105 cases operated upon, there were only seven postoperative deaths. Eight patients were treated palliatively by interruption of the phrenic nerve. Of 90 patients who recovered from radical operative repair, 88 have been completely relieved, and two have had a recurrence of symptoms and the hernia.

Mediastinal Tumors—Andrus and Heuer remark that as more and more successful results have appeared in the literature, it has become evident that in all such cases the advisability of surgery should be considered. To be sure, in certain groups such as the lymphosarcoma, or in Hodgkins disease, surgery has little or nothing to offer except as a diagnostic aid. But in most of the others the operative results have become increasingly more satisfactory, and in many definite benefit, varying from relief of symptoms to spectacular cure, has been obtained.

Pulmonary Carcinoma—In speaking of primary carcinoma of the bronchus, Graham states that up to the present time the evidence regarding effective treatment by either radium or X-ray has not been very convincing. Wide surgical removal offers the best chance of recovery. Lobectomy probably will be found not sufficiently radical. Total removal of the lung has the advantage of permitting the removal of enlarged mediastinal nodes, and a closer approach to the trachea. Reported cases and the author's personal experience indicate that total pneumonectomy is technically possible and practical.

Pneumonectomy—Reinhoff maintains that certain improvements in the technic of pneumonectomy, as well as in preoperative preparation and postoperative care, have been made in the past two years. The material on which his conclusions are based consisted of ten cases in which total pneumonectomy was performed and 20 in which thoracic exploration provided an opportunity for the observation of technical methods. Overholt states that one lobe or an entire lung on one side can be removed successfully. Twenty-three cases of proved primary cancer of the lung form the nucleus of his report. Metastatic lesions were found in six patients, and two additional patients were rejected for operation as a result of poor general condition. The remaining 18 were subjected to thoracic exploration. Mediastinal infiltration

was found in seven. In two, lobectomy and in six, pneumonectomy was performed. There were three operative fatalities. At the time of his report, three patients treated by pneumonectomy were living; one 20 months and another 14 months after the operation.

Cardiac Surgery

Intravenous Evipal for Acute Coronary Occlusion—Donath, of Vienna, gave slow intravenous injections of evipal to six patients suffering intensely from acute coronary occlusions and to one with severe coronary sclerosis whose symptoms resembled angina pectoris. Each of the patients fell into a profound sleep, lasting from one-half to ten hours, and awakened with the pain considerably abated. Dosages varied from 1½ to 2 cc. of ten per cent sodium evipan. Each cubic centimeter was injected over a two to three minute period. In two cases a fall in blood pressure was noted as a warning sign.

Traumatic Cardiac Surgery—Mayer states that over a two-year period, seven cases of injury to the heart and pericardium were treated in the Louisville City Hospital. Five patients recovered and two died. Death in one case was due to hemorrhage, and the author feels that an autotransfusion might have saved this patient. Two patients recovered without operation. Five patients required major surgical treatment. In four the heart was injured. A transpleural approach utilizing modifications of Spangaros' incision was used in all but one patient.

Thyroidectomy for Heart Disease—Clark, Means and Sprague report the results of total thyroidectomy performed on 21 patients with cardiac disease at the Massachusetts General Hospital from July, 1933, to May, 1935. Of these patients, 19 had congestive failure and only two had angina pectoris. The operation was considered worth-while in only about one-fourth of the entire series. The relatively poor results were due largely to difficulty in the selection of the cases. At first, too severe cases were chosen. Of the cases which were well selected and managed, worth-while results were obtained, at least temporarily, in 50 per cent. The authors believe that the effects of the operation must be studied further before its value in the treatment of heart disease can be determined definitely.

Adhesive Pericarditis—The first surgical cure of this condition in America, according to White, was obtained in the case of a 15-year-old girl, who, in 1928, was subjected to an anterior pericardial resection with removal of a band compressing the inferior vena cava. White has reviewed the literature and reports 15 cases of chronic constrictive pericarditis or Pick's disease treated by pericardial resection. Six deaths from various causes occurred in this series. The so-called Delorme operation is the only cure for Pick's disease. Cases of chronic constrictive pericarditis have a poor prognosis for health unless they are suitable for and are treated by operation.

Suppurative Pericarditis—Shipley has found that up to January 1, 1934, 227 cases of suppurative pericarditis had been reported. His article describes the present condition of six of the seven who recovered from the opera-

tion for drainage of his total 12 cases. There is abundant proof that the operation may be followed by no clinical evidences of serious interference with cardiac function. The author collected from the literature 39 cases in which at least one year had elapsed since the pericardiectomy. Of the author's seven patients who recovered after the operation, six have been traced. Five have no clinical evidences of disability. The author concludes that the lower anterior approach is better than the higher parasternal approach at the level of the fourth and fifth costal cartilages. Moore, however, believes that when the pericardial infection follows a left-sided empyema, a left-sided posterior approach to the pericardium is the procedure of choice. Moore reports a case in which recovery resulted after the establishment of drainage by this route.

Abdominal Surgery

Preoperative Decompression—This is a problem that has for some time occupied the attention of McNealy and Lichtenstein of Northwestern University. Obvious to the gastroenterologist is the fact that a stomach properly prepared preoperatively for gastrojejunostomy will react better to the actual operation than a dilated stomach, the walls of which are thickened and edematous, and where the pyloric orifice is occluded. The McNealy-Lichtenstein method of preparation for gastrojejunostomy is essentially this: the stomach at the outset is evacuated of gross contents by a stomach pump, so that undigested food particles will not later interfere with suction. Continuous aspiration is then instituted.

Subtotal Gastrectomy for Peptic Ulcer—Selecting statistics from the literature, Bland, of Cleveland, compiled a series of 5,572 carefully followed-up cases of gastroenterostomy in which a total of 71.7 per cent of cures were reported. The results in different series varied from 47 to 90 per cent. On the other hand, in 3,122 cases of gastric resection collected from 16 different clinics, the percentage of permanent cures fell within a higher and much narrower range, namely: from 82 to 98 per cent. Bland's arguments in favor of subtotal gastrectomy, as compared with the more conservative operations of gastroenterostomy and various pyloroplasties result from the facts that subtotal gastrectomy is the only procedure which will consistently, in his opinion, bring about a permanent cure for peptic ulcer, and that in certain types of ulcer, medical treatment is foredoomed to failure.

Regional Ileitis—Since Crohn, Ginzburg and Oppenheimer first described the entity known as regional ileitis or enteritis an increasing number of cases have appeared in the literature. In advanced cases the involved loops of lumen roentgenologically resemble a cotton string. This Kantor calls the "string sign." Finally, during 1936, in connection with the report of eight cases, Meyer and Rosi outline treatment of the condition as follows: "The treatment of regional enteritis varies with the phase of the pathological process. Acute regional enteritis limited to the bowel and not associated with thickening of the mesentery may resolve

spontaneously. If, however, the mesentery is thickened and indurated, it is probable that ulceration of the mucosa has extended into the mesentery; spontaneous resolution is less likely to occur, and a short-circuiting operation or a resection is indicated. Chronic regional enteritis with stenosis is best treated by resection or a short-circuiting operation. When complicated by an external intestinal fistula, resection of the involved bowel with the fistulous tract is necessary to close the fistula."

Idiopathic Ulcerative Colitis—McKittrick and Miller report on a series of 149 cases of chronic idiopathic ulcerative colitis seen during the past 20 years in the wards of the Massachusetts General Hospital. The patients were all studied with particular reference to the value of, and indications for, surgical treatment. The authors believe that the only surgical procedure indicated in ulcerative colitis is one which will give complete rest to the affected bowel segment by diverting the fecal stream externally proximal to the disease. Ileostomy is the operation of choice. Preceded and followed by blood transfusions, it is frequently a life-saving procedure. Approximately 40 per cent of the patients surviving ileostomy will later require removal of the diseased colon. The results after subtotal colectomy are excellent. In the 149 cases reviewed, there were 27 deaths, a mortality of 18 per cent.

Resection of the Liver—Moller reports the case of a woman, 29 years old. Over a period of ten years she had been subjected to repeated laparotomies for recurrent ovarian tumors with secondary malignant degeneration. A liver metastasis the size of a fist was removed by resection of the liver. Six years after the operation on the liver the patient was able to work and showed no signs of recurrence or metastases. Microscopic examination showed all of the tumors to be granulosa-cell carcinomas.

Amebic Hepatic Abscess—According to Joslyn of St. Louis, who reports two successful aspirations of amebic liver abscesses, there are many advantages to treatment by this method over surgery. In reported series of cases, the surgical mortality has ranged well over 50 per cent. Once the diagnosis has been established, the patient is bridged across two beds in such a position that the part of the abscess nearest the surface will be in the most dependent position. A large-gauge needle is then inserted into the area where the abscess has "pointed," usually the tenth intercostal space, and just through the wall of the abscess. The point of the needle is then in the most dependent portion of the abscess and in position to evacuate the contents of the lesion entirely. This needle is connected to a Wangenstein suction apparatus. A second large needle is then inserted into the abscess at any other point, and is connected to an ordinary gravity flask containing 1:2,500 emetine solution. The circuit is opened and the entire contents of the abscess are flushed out. In such a manner one evacuation is deemed sufficient. Several hundred cubic centimeters of the emetine solution are left within the cavity.

Acute Gall Bladder—Taylor, of Indianapolis, has made an analysis of 129 consecutive cases of acute gall

bladder grouped according to their morphological findings as (1) acute edematous, (2) acute suppurative and (3) acute gangrenous. The mortality for the entire series was 16.3 per cent. Patients operated upon the first four days after acute onset gave a mortality of approximately five per cent. Of those operated upon five or more days after onset, 23.8 per cent died. In this entire series, if the patient was operated upon during the first four days of his acute disease, the chances of death were about 1 to 20. On the other hand, if the decision was made to allow the gall bladder to "cool" or if, failing in this, it was operated upon five days or more after acute onset, the chances were one to five that the patient would die. In view of this uncertainty and the high mortalities resulting from a waiting policy, prompt operation is indicated. No case is so urgent that preoperative administration of adequate amounts of glucose can be neglected.

Acute Hemorrhagic Pancreatitis—Experience with acute pancreatitis suggests to Dean Lewis, of Johns Hopkins University, that if a differential diagnosis could be made between peritonitis due to perforation and pancreatitis, it would be wiser to delay immediate operation. In 76 cases cared for between 1926 and 1934 by Walzel of Graz, 30 were treated between 1926 and 1928. Of these, 26 died, a mortality of 86.6 per cent. The remaining 46 were operated upon between 1929 and 1934; of these, 13 died, a mortality of 28.3 per cent. Walzel therefore concluded that in doubtful cases an exploratory laparotomy should be done. If pancreatitis is found, the operation continues only if a common duct stone is found, in which event, drainage and choledochotomy are done; or if acute phlegmonous cholecystitis is discovered, in which case cholecystostomy is indicated. Lewis admonishes all surgeons to employ glucose solutions with great care, because the intravenous administration of glucose in hemorrhagic pancreatitis might increase the existing damage by stimulating further flow of the pancreatic juice.

Injection Treatment of Hernia—Harris and White conducted an investigation involving 100 consecutive cases of hernia injected in the Out-Patient Department of the Mount Zion Hospital of San Francisco. All cases were treated successfully, without any serious complication. Results of their study show that this method may be advocated as a valuable adjunct to the surgical armamentarium. Modern solutions used for the injection treatment are based on the principle of producing new fibroblastic tissue, without local injury or danger from toxic absorption. If a hernia is completely reducible, this method is applicable to any patient who can be fitted with a truss which will maintain complete reduction during active treatment. The evidence submitted should suffice to convince the profession that this method of treatment is worthy of a thorough and impartial investigation.

Gynecological Surgery

Hysteroscopy: Its Technic and Results—It is Hamant's and Durand's opinion that hysteroscopy has be-

come a most important diagnostic procedure for every gynecologist. Hysteroscopy is contra-indicated in fixed retrodisplacements of the uterus, pregnancy, periuterine inflammations, and profuse metrorrhagia. The chief difficulty in hysteroscopy is not the technic, but the interpretation of the images. The authors present 22 illustrations in color to show their findings in normal and pathological conditions.

Ovarian Grafts—Hot flashes which constitute ablation symptoms in young women recovering from hysterectomy and bilateral oophorectomy can be relieved in a large number of cases by autotransplantation of ovarian tissue, reports Shaw, of the University of Southern California. He describes the operative technic as follows: a piece of ovarian tissue appearing normal is excised from the interior of the ovary when the specimen is removed. This is laid on a gauze pack on the instrument tray, and cut with a sharp scalpel into bits of two or three millimeters in diameter so that vascularization will be favored. The material is next wrapped in a gauze sponge and placed in a bowl of warm saline solution, where it remains until the peritoneum has been closed. He then raises by blunt dissection the fascia of one of the rectus muscles near the midpoint of the incision, with care exercised to prevent bleeding. The fibers of the muscle are then separated bluntly to receive the graft, and the opening in the muscle is closed with No. "O" catgut, the suture being placed loosely. Of 53 cases properly traced, only 13 got no relief from ablation symptoms. Binet believes that the chief indication for ovarian grafts is the prevention rather than the treatment of disturbances caused by surgical castration. Removal of the genital organs of women is followed by more or less serious disturbances in 75 per cent of cases. According to Tuffier, autoplasmic grafts take in 67 per cent of cases. Autoplasmic grafting is, of course, superior to either homoplastic or heteroplastic grafting.

Cancer of the Cervix—Tyrone, of Tulane University, attributes to the use of the Schiller test and the colposcope the early diagnosis and salvation by hysterectomy of 158 women. These patients were examined before subjective symptoms of cervical carcinoma appeared. The Schiller test consists of painting the portio vaginalis with Lugol's solution. Cancerous lesions stain lightly or not at all. The colposcope is a microscopic or telescopic arrangement of lenses by which it is possible to study cell changes without removing any tissue. Tyrone believes that every woman within the limits of the cancer age should be given the Schiller test and examined with the colposcope at least once a year.

Genito-urinary Surgery

Prostatic Surgery: Its Present Status—After performing transurethral resections in 100 cases, Laidley and Earlam conclude that transurethral resection is the operation of choice for median-bar and the best palliative treatment for prostatic carcinoma. In general, the authors believe that unsatisfactory results are to be attributed not to the operation, but to failure to perform

it efficiently. They are not yet convinced, however, that transurethral resection is as surgically sound as open prostatectomy for the patient in good condition with a considerable life expectancy and a median-to-large adenomatous prostate. Mathe and Balleca, after studying 237 cases of prostatic hypertrophy, conclude that when properly done, transurethral resection is followed by less shock and associated with much less risk of complications than prostatectomy. Voelcker, too, is convinced that not all problems of prostatic surgery will be solved by the transvesical method alone.

Mal-development and Mal-descent of the Testes—Dorf treated 14 boys ranging from six to 13 years of age who showed mal-development or mal-descent of the testes. The gonadotropic anterior pituitary-like hormone obtained from the urine of pregnant women was used. The treatment was begun after puberty. Of eight cases of undescended testes, all but one in which there was mechanical obstruction responded to the administration of the hormone. The author believes that operation should not be done until hormone therapy has been tried for one year without success. In the cases of mal-development, under hormone therapy, with thyroid when indicated, the testes increased in size; the scrotum filled out and progressed toward normal development; undescended testes increased in size and descended; the penis enlarged in size and thickness; pubic hair appeared, the epididymides and prostate were stimulated; a congenital hernia, if present, sometimes became corrected, and the general mental aspect changed.

Injection Treatment of Hydrocele—Krug reports satisfactory results from injection of primary hydrocele with sodium morrhuate in 10 cases. Krug's technic, which is applicable to office use, is described in part as follows: by the use of a small syringe and needle, 1.2 cc. of a total volume of 2.5 cc. of a two per cent solution of procaine is used to secure anesthesia of the skin. Then a 19-gage needle is pushed beneath the skin in the subcutaneous tissue for about an inch, and then into the hydrocele sac, which is emptied as completely as possible. The remaining anesthetic solution in the small syringe is injected into the sac through the large needle and is spread about inside the sac by gentle manipulation. Again by the use of the small syringe and needle, 3 cc. of a five per cent sodium morrhuate with benzyl alcohol is injected into the sac through the large needle which is then withdrawn. The scrotum is gently manipulated to spread the solution and the light suspensory applied. Following the injection, the patient is ordered to bed for the remainder of that and the following day. In three to four weeks, accumulation of fluid may indicate a second injection.

Fractures

Ambulatory Treatment of Femoral Neck Fractures—From Chicago has come a technic for the ambulatory treatment of fractures of the neck of the femur devised by Apfelbach and Aries. These authors report their technic as follows: all patients entering the female fracture service with acute fractures are given a quarter-grain of

morphine sulphate and placed in Buck's extension by skin traction. This immediately relieves the muscle spasm and pain, thus combatting shock. A roentgenogram is taken with a portable machine and the diagnosis is confirmed or corrected. When the patient has recuperated sufficiently, usually five or six days after the fracture has occurred, she is placed in a stockinette fabric on a Hawley table and anesthetized with ether. Whitman's closed manipulative reduction is performed. The fragments are artificially impacted by the Cotton method. All bony prominences are padded with sheet wadding and felt, and a snugly fitting plaster cast is applied. The cast extends from the toes of the affected side to the sixth rib on the opposite side. A metal walking-iron is incorporated in the cast. The cast is finished with the limb in abduction. An inexpensive light weight, shoe-elevation is constructed of several thicknesses of celotex, covered with a thin rubber matting and clamped to the patient's old shoe. A roentgenogram is taken when the case becomes dry and, if the position is satisfactory, the patient is taught to walk with the aid of crutches. Among the authors' impressions of this form of treatment are the following: by obtaining accurate apposition of fragments with impaction, the patient can advantageously be made ambulatory. Seventeen, or 77 per cent, of fractures of the neck of the femur in this series of 22 selected cases have united. Thirty degrees of abduction with sufficient inversion to cause a disappearance of the lesser trochanter from the anteroposterior film is the optimum position in reduction. The average time of hospitalization has been reduced from 110 days to 30 days.

Ambulatory Treatment for Fractures of the Femoral Shaft—In this new method, presented by Anderson, four Steinman pins or Kirschner wires are inserted, two in the region of the greater trochanter in the proximal fragment, and two in the distal fragment. The uppermost half-pin is inserted obliquely in a distal and medial direction from a point about the center of the lateral aspect of the greater trochanter. The half-pin clamp is held parallel to the thigh. The oblique hole in the lower end of the clamp provides the guiding agency for the insertion of the second short pin, which is inserted into the shaft at an angle to the trochanteric half-pin. Both half-pins should completely transfix the femur. A distal transfixion is made at the superior border of the condyles; however, to supply positive fixation, this distal insertion is supplemented with a second pin or wire through the shaft at a point about two inches above the lower transfixion. It should not be placed parallel with but at a slight angle to the axis of the first distal transfixion. This double pair of transfixions not only supplies skeletal traction and countertraction, but provides means for separate and direct management of each fragment. Traction for reduction can be supplied by a fracture table or a specially-designed sling for femoral fractures. When reduction has been checked roentgenologically, the plaster is snugly applied from the iliac crest down to a few inches below the knee. Plaster over the patella and posterior to the knee joint is at once cut out.

A Review of 1936 Literature on Proctology*

By

Walter A. Fansler, M.D., F.A.C.S.**
Minneapolis, Minnesota

IT IS the purpose of this review briefly to call attention to the advancements made during the year in the field of proctology. No attempt is made to give a complete résumé of all the literature, but rather to select the material which offers some new or improved ideas. On the subject of anatomy, Nesselrod¹ has presented an exhaustive article on the lymphatics of the pelvis. Anyone wishing to review the possibilities of spread of malignancy or infection in this region can well read this article with profit. Likewise, Morgan⁸ presents a very painstaking work on the anatomy and embryology of the anal canal. Agranulocytosis, or agranulocytic angina, is the subject of many articles. The occurrence of rectal lesions in this condition is seldom mentioned. It may, however, be the only external lesion present. A sluggish-appearing ulcer with a necrotic base should always make one suspicious, especially in a patient who seems constitutionally ill.

It seems to me there has been little new offered on the subject of hemorrhoids. Articles have to do mostly with the use of sclerosing injections. To my mind it is doubtful if these "new" formulas offer any particular advantage over those already in use. In this connection may be mentioned the employment of various injections to prevent postoperative pain. These are usually perirectal injections of various anesthetic substances in an oily base. These are of value in selected cases, but their indiscriminate use is to be condemned, as pointed out by Gorsch² and Simmons³, and Kilbourne⁴.

The occurrence of rectal and rectosigmoidal endometriosis is reviewed by Rosser⁵. It is well to remember that when this condition occurs in the bowel wall, it may produce an ulcerative lesion which from its appearance alone cannot be differentiated from rectal carcinoma. The fact that the mass seems largely extra-rectal may make one suspicious; but a biopsy is the only way of making a positive diagnosis.

Lymphogranuloma inguinale is voluminously dealt with. Treatment insofar as the rectal manifestations are concerned, is relatively unsatisfactory. Because of difference in the lymphatic drainage from the genital organs of the male and female, the preponderance of rectal lesions (ulceration and stricture) occurs in the female. The majority of cases will show a positive Frei test; but it may be necessary to try several different antigens before getting a positive reaction (Martin⁶). The majority of rectal strictures, thought in the past due to syphilis, are doubtless due to this condition. Permanent colostomy may be necessary in some of these patients.

There is increasing literature upon the treatment of fissure in ano by ambulant methods, making use of anesthetic solutions producing prolonged anesthesia. Daniels⁷ describes this method in detail. This treatment is based on the theory that with dilation and relaxation of the anal canal and the relief of pain, the fissure can be healed by local treatment, and surgery avoided. I believe that this is quite correct in some cases; but I am convinced that time will show that a not inconsiderable number of these cases will recur, and that surgery is still frequently indicated. This is particularly true when we consider that very often there is other rectal pathology present which requires surgery, in which case there is no advantage in dealing with the fissure medically.

To my mind there has not been the slightest advance made in the treatment of pruritus ani, which (in my opinion) is a symptom complex rather than a disease entity. It should be realized that the causes of this condition are many, and that these causes must be sought out in each case individually, if the best results are to be achieved. Further, that it is often impossible permanently to remove the cause of the condition, and that with a recurrence of the underlying factor, the pruritus also recurs. If we cease to search for a universal "cure" and concentrate more upon the management of the condition by the patient, himself—after doing what we can locally—results will be better and the confidence of the patient retained.

There was nothing of note during 1936 in connection with the treatment of anorectal fistula. The subject of ulcerative colitis seems to be as much in dispute as ever. There does, however, seem to be some points of common agreement as to the clinical findings and course of the disease, even though the etiology may not be agreed upon. In other words, in many cases the patient when he presents himself to the physician is often suffering from an ulcerative condition of the colon, which is a secondary infectious process, the original cause of the infection having disappeared. Treatment then is best based on this premise. Now we also recognize the disease "regional colitis" where only a definite segment of the bowel is involved. Probably some of the cases of diffuse colitis begin as a "regional colitis." Regional ileitis, likewise, comes in for considerable comment. In the past, no doubt, many of these cases were overlooked. At present, the consensus seems to be that the surgical removal of the diseased segment of bowel is the best form of therapy, if the patient's condition warrants it.

The writings on precancerous and cancerous lesions of the colon and rectum are legion. The fact that many cancers do develop from adenomas has long been generally accepted. Buie and Brust⁹ present an excellent

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**Assistant Professor of Surgery, University of Minnesota.

résumé on this subject. There is a tendency in most quarters to do a greater number of one-stage abdominal perineal resection for radical removal of rectal carcinomas, though this operation should be reserved for patients without obstructive symptoms, and whose general physical condition is average or better. Multiple-stage procedure for colonic cancer is generally accepted. The more general use of nasal suction, as developed by Wangenstein, has been a definite contribution toward the reduction of the mortality rate. The use of electro-coagulation or fulguration of stenosing lesions has offered a wider field for the adequate treatment by radium application (Bowling and Frick¹¹). Attention is called to the use of electro-coagulation in the treatment of cancerous and precancerous lesions of the rectum and rectosigmoid (Straus¹⁰) as palliation in inoperable lesions and as a curative method in very early lesions it is of value. A statistical review of carcinoma by Dixon¹² gives an actual statistical report of what can really be expected under proper management of cases of this type.

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A Review of 1936 Literature on Ear, Nose, Throat and Bronchoscopy*

By

Kenneth A. Phelps, M. D.**

Minneapolis, Minn.

Otology

DURING 1936 many workers have continued their investigation of the physiology and the pathology of hearing. Polvogt found numerous pathological changes in ears which had normal hearing, most of these changes being in the middle ear. This proves again that normal hearing may exist in spite of certain changes in the drum or middle ear. The Wever Bray apparatus has been experimented with in laboratories at Harvard, John Hopkins, University of Minnesota, and other institutions and further knowledge concerning tone localization, in the cochlea, has been obtained.

The program for the reclamation of the moderately deafened child, as outlined by Fowler, consists of: (1) routine group tests to discover these children, (2) treatment when indicated must be insisted upon, (3) lip-reading begun early, (4) front seat in school and classes for the severely deafened.

Menier's disease has been treated by dehydration with good results by some and doubtful results by others. McMurry reports eleven cases treated by Dandy's operation of section of the vestibular branch of the auditory nerve. Eight were completely relieved. Davis advises

operation on the vestibule of the labyrinth, as being less formidable; and reports six cases satisfactorily treated in this manner.

Aural vertigo or Menier's syndrome is relieved, according to McMurry, by removal of foci of infection, forbidding tobacco and alcohol, and treating the Eustachian tube, or by Furstenberg's diet.

One important subject in otology is the testing of hearing. The necessity for precise measurement of hearing has produced many devices for this purpose. The most recent are the electric audiometers. These instruments should produce pure tones of the desired pitch and intensity, all controllable by the examiner. Graphs are made which chart the acuity of hearing by air and bone conduction. The percentage of hearing-loss is obtainable and may have considerable importance as the basis for damages in compensation cases. Such instruments can be used to test the hearing of groups of individuals, as school children, and those with defects of hearing can be discovered.

The audiometer is not necessary for diagnostic purposes. It offers a convenient method of testing hearing.

Sound-proof rooms can be built in noisy down-town offices at a fairly reasonable cost, and make testing of hearing more accurate. Jones and Knudson believe that from a practical standpoint, since most hearing tests are carried on in a noisy place, the results are quite comparable without a sound-proof room.

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**Assistant Professor of Otology, Rhinology, and Laryngology, University of Minnesota.

These diagnostic instruments are frequently manufactured by the same companies which make devices for aiding the hearing. The commercial concern has salesmen calling themselves audiometrists, who test hearing and prescribe hearing devices—similar to the optometrist examining vision and prescribing glasses. This situation has given rise to a new problem in the practice of otology. The otogram is of little value without the clinical history and a complete examination of the patient. Patients who need medical attention, and can be helped by it, will inevitably be missed when they are examined and treated by a non-medical person. Shambough reports many such cases and makes a strong argument for the otologist's rather than the layman's diagnosing and prescribing for the deaf.

Regarding hearing aids: Harting and Newhart of the University of Minnesota have examined these devices in the physics laboratory and find that the claims made by the manufacturer are not always substantiated. The authors propose a test of sentence intelligibility, though they state that practical trial of the instrument by the patient is advisable.

The literature of the past year has many references to suppurative diseases of the ear. In general, the well-established methods of treatment have not been changed. The relationship of sinusitis to otitis media has been emphasized by Cullum; the importance of otitis media in infancy and its relationship to intestinal intoxication is discussed by Litschkus. Lemaitre believes otitis media due to pneumococcus Type No. 3, is of increasing frequency, and points out its treacherous nature, particularly the absent symptoms of mastoiditis.

Mastoiditis, as usual, occupies a large amount of space in the literature. The technique of operation seems settled for acute mastoiditis; but the term complete mastoidectomy rather than simple mastoidectomy, seems to be coming into more general use. For chronic mastoiditis, most authors advise that local treatment be tried, and agree that attic or peripheral perforations of the drum indicate some danger of complications, while the risk in central perforation is negligible. The Bondy type of modified radical operations is advised by some (Shambough).

The complications of mastoiditis are considered in detail by many authors. Boise reports on extradural inflammation and states that 90% of the complications are due to direct extension from the mastoid.

Petrositis is now a well-recognized condition, and there are numerous reports of cases successfully treated. The operative procedure is not yet standardized; but the majority of men seem to follow Friesner in both indications for and technique of surgery.

Thrombosis of the lateral sinus is discussed by Dunn and Cowan, who state that surgery is indicated. Stone and Berger report on thrombosis of the sinus complicating thrombosis of the jugular vein. Other authors report their results, but the old problem of when to ligate the jugular vein, if at all, the diagnostic value of spinal fluid cultures, and when to employ transfusions, are not settled so that there is unanimity of opinion.

The surgical repair of the facial nerve is reported by Martin of San Francisco, who followed the technique brought out by Duel and Ballance. He states that muscular movement returns; but not always emotional control. The frontalis muscle and the function of the chorda tympani do not return to normal. Sullivan of Toronto believes that such operations should not be done until six months after the paralysis occurs, spasm being thus avoided. Other men disagree, and report their cases to prove that the sooner the operation is done, the better will be the results.

Intracranial complications of ear diseases are discussed by many writers. No important addition has been made to the existing knowledge of prevention or cure.

The Nose and Nasal Sinuses

The recognition of the part played by the mucin in nasal and sinus diseases, which is largely due to Hilding's work, has changed some of the older ideas concerning these conditions. Fenton and Larsell, after five years of investigation, conclude that almost any preparation, not of isotonic strength, applied to the surface of the sinus or nasal mucosa, acts as an irritant.

The treatment of allergic rhinitis by ionization, has advocates who report large series of successful results, while others, notably Dean, have found microscopic changes in the mucosa which show atrophy and fibrosis and therefore advise against it. The general opinion seems to be that ionization will give relief but should be used only in those cases which do not respond to the usual treatment of the allergist.

The question of the sinuses' acting as a focus of infection has received considerable attention. Mitchell believes they often are a focus in children. The treatment of children's sinus in general should be conservative, but some authors, as Pirez, advise operation more frequently, particularly in asthmatics. Burman advises an elaborate treatment both locally and generally. He advises proper diet, hygiene, restriction of salts, administers calcium, viosterol, parathyroid extract, and antogenous vaccines. Locally a spray of cocain and ephedrine, suction and oily sprays. For the acute stage he uses hot foot baths, hot liquids, citrus fruits, powder of ipecac and opium, atropine in small doses and salicylates, steam inhalations and radiant heat. Leroux believes Americans pay too much attention to diet and not enough to climate.

Cook and Grove found sinusitis to be an etiologic factor in 92% of 240 cases of asthma. Manges now X-rays the sinus routinely in all non-tuberculous chest cases, and finds sinusitis in 60% of the cases. He also finds that 85% of the sinus cases have pulmonary diseases.

Kartogener and Ulrich report on the relationship between sinusitis and bronchiectasis, and find it to be definite: bronchiectasis occurs after sinusitis, and sinusitis occurs after bronchiectasis.

Parfitt cites 1000 psychiatric patients, in 818 of whom sinusitis was found, and striking results were obtained by treatment.

Ocular and orbital diseases may be related to sinusitis. Sargnon believes that removal of the posterior tip of the middle turbinate reduces the retinal circulation, and cases of retrobulbar neuritis so treated obtain benefit, due to reduction of arterial blood pressure in the retina. Many authors, Dunnington, Fisher, and others, believe most cases of retrobulbar neuritis are due to multiple sclerosis, and advise against operation on the sinuses.

Intracranial complications from sinus diseases are discussed by numerous authors, and many cases are presented, but nothing new has appeared in this year's literature.

The common cold is again a subject of many articles, one of the most interesting being by Browning and Glasgow, who conclude that 60% of the people have two or three colds every year. Colds are due to some agent not harbored by those attacked, *e. g.*, the Eskimos. The agent is a filter passing virus. Ordinary organisms found in the nose may play a part in colds and certainly do in the complications. Climate has little to do with colds, though sudden changes in the weather have a relation to colds; individual living habits are of no importance as a cause of colds; nasal douches and mouth washes are not of prophylactic value. Vaccines do not help prevent colds; only gross dietetic errors are a factor. Tonsillectomy and nasal operations have no effect. Therapeutic experiments were conducted on university students; 75% of the group were given codeine and papaverin, and reported improvement in a day. Thirty-five per cent of the other group, who thought they were receiving the same treatment, also reported improvement.

The Pharynx

Lillie discusses granular pharyngitis, the type found following tonsillectomy, and reports the best results by administration of iodides by mouth. He believes X-ray, local applications, and operative removal of pharyngeal lymphatic hypertrophies to be disappointing.

Roy reports his method of treating residual lymphoid tissue in the nasopharynx, advising trichloroacetic acid applied on a wire through a rubber Eustachian catheter.

The tonsil, as usual, is the subject of many articles. The field, from embryology on, is covered and nothing really new has been brought forth. Pollitzu writes on "The Pediatrician Looks at the Tonsil," and he gives the indications for tonsillectomy as "repeated attacks of tonsillitis, increasing in severity with or without systemic disturbances." He concludes that infected tonsils are a factor in causing rheumatic fever, scarlet fever, and chronic heart diseases; but tonsillectomy militates against the incidence of bronchitis, pneumonia, and sinusitis.

Advanced cancer of the pharynx is treated by the Coutard X-ray technique, in most parts of the world, and reports from numerous places are encouraging. Radium is usually used in conjunction with the X-ray. Martin and McNatten report 140 cases with a 20 to 30-months' cure in 29%. The percentage of cures is higher in women than in men. The histologic type seems of little influence in the prognosis. Zippinger and Stuart Harrison report 150 cases and a 27-month cure

in 17%. Duffy reported 176 cases of cancer of the tonsils over a ten-year period with 18% cured for three years. To the reviewer these figures are indicative of real progress in the treatment of cancer. Perhaps the day will come when cancer can really be controlled.

The Larynx

The same method of treatment, referred to above, has been used for cancer of the larynx with probably better results. Most writers still feel that surgery followed by radiation is the best treatment for intrinsic cancer of the larynx, that is, for cancer that can be removed by operation, even though the operation is a total laryngectomy.

Numerous articles have appeared dealing with the diagnosis and treatment of laryngeal disease, mostly case reports. Nothing of unusual importance has been noted.

Esophagoscopy and Bronchoscopy

The flexible gastroscope is being used more frequently, according to the numerous reports in this year's literature. It can be passed about as easily as a stomach tube, and a very good view obtained of the gastric mucosa. No operative work, such as removing foreign bodies or biopsies, can be done through this instrument, as it is a closed tube. For this purpose the open tube must be used.

This instrument has demonstrated that gastritis is of frequent occurrence (Schindler). This lesion is not so easily diagnosed by any other means. Eusterman believes that gastritis deserves more serious consideration as an underlying factor in gastric diseases, such as pseudo-ulcers, nervous indigestion, gastrotoxic hemorrhage, and gastrogenic diarrhea. He also believes numerous symptoms may arise from gastritis, but cautions against over-enthusiasm on the part of the gastroscopist, and advises that the gastritis problem will be solved only "by careful appraisal of all facts through team-work on the part of the clinician, laboratory worker, and the surgeon."

Some writers, as Jackson, express the opinion that gastroscopy will become a routine in every gastroenterologist's study of patients with gastric symptoms. He warns against passing the instrument without thorough preliminary knowledge of the condition of the esophagus.

The reports in the field of esophagoscopy have dealt with numerous subjects as: the Plummer-Vinson syndrome, McGibbons believing the anemia is probably secondary to the dysphagia. Diaphragmatic hernia may occur in conjunction with other diseases of the esophagus, according to Vinson, who reports cases of hernia associated with strictures or spasm of the esophagus. Pitkins reports a case of stricture of the esophagus due to lactic acid. He points out the danger of mistakes in preparing infant-feeding mixtures.

Cancer of the esophagus is discussed by numerous authors, who call attention to the well-known fact that

most of these cases are first diagnosed when the disease is advanced.

The use of the bronchoscope for diagnostic purposes is much more frequent than ever before. Many authors dealing with its diagnostic possibilities, such as Gerlingo, who discusses hemoptysis. Morlock reports a series of benign tumors. Kramer, Kernan, and Jackson all report cases of adenoma of the bronchus. This tumor is difficult to diagnose by section, but is clinically benign, for most cases recover following removal of the tumor, and no recurrence develops.

Cancer of the bronchus and lung is apparently increasing in frequency. The bronchoscope aids in its early diagnosis and treatment, though X-ray and radium still offer the best treatment. Some cases of removal of the whole lobe or the whole lung are on record, and surgery may eventually be the solution of treating cancer of the lung.

Bronchoscopy in tuberculosis is teaching us something about tuberculosis of the bronchi. Stenosis of the bronchi and its relationship to collapse therapy is discussed by Phelps and Cohen, who believe bronchiectasis

in the tuberculous individual is often due to bronchial stenosis, and is not true tuberculous bronchiectasis. Bronchoscopy is not contra-indicated in tuberculosis, as shown by their report of over one hundred bronchoscopies performed at Glen Lake Sanatorium.

The value of bronchoscopy in treating pulmonary abscess is the subject of articles by Pinchin, Knight, Kernan, Soulas, and others. They agree that the abscesses connected with the bronchus, and of not-too-long standing, are the ones in which bronchoscopic treatment is most successful.

As usual, foreign bodies are frequently reported. Jackson's new book is based on over 3000 such cases in his own experience. While foreign bodies continue to be an important part of bronchoscopy, the largest field is now considered to be its diagnostic and therapeutic possibilities in diseases of the lung.

The report of Barach, on the use of helium mixed with oxygen to relieve obstructive dyspnoea, is very interesting. He reports good results in status asthmaticus also.

A Review of 1936 Literature on Ophthalmology*

By

Charles Wilbur Rucker, M. D.**

Minneapolis, Minn.

RECENT advances in ophthalmology of general interest are few. A review of the literature reveals the usual modifications of the various operations for strabismus, detachment of the retina, glaucoma and cataract, that will in turn be modified still further next year. Medical treatment has elicited less comment. There are a fair number of reports of unusual cases and of descriptions of disease. While these works are necessary steps in the development of an art, they need not concern one outside the specialty. Of fundamental importance are articles by Ranson and Magoun, and Scala and Spiegel, on the location of the afferent light reflex that will eventually lead to a better understanding of the pupillary reflexes; of reports by Poljak on the minute structure of the retina in primates; and by Carl Behr on the septal system of the optic nerve. Notwithstanding their ultimate value, their clinical importance does not warrant discussion here.

There are a few topics of more general interest in which there has been progress and which have aroused some comment. Of these, I have chosen to discuss three: a new cause of cataract, invisible spectacles, and the cross-eyed child.

Within the past two years a new cause for cataract has confronted the ophthalmologist—dinitrophenol. The drug itself is not new. Its effect on the metabolic rate of dogs was studied by Gibbs and Reichert 45 years ago.

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**Instructor in Ophthalmology, University of Minnesota Medical School.

During the war it caused so many poisonings and deaths among French munitions workers that special pharmacological studies were made at that time. Since 1933 Tainter and Cutter of San Francisco have published a number of studies on its use as a metabolic stimulant. They found that it could stimulate the consumption of oxygen to ten times its basal value, and that it caused oxidation of both carbohydrates and fats. They showed that when it was given in daily doses of 3 to 5 mg., patients lost weight without having to take the trouble of restricting their diets. Although they observed no undesirable effects, these authors and also editorial writers in *The Journal of the American Medical Association* warned against the uncontrolled administration of the drug. Commercial concerns supplied it under various trade names to be sold in drug stores as a reducing agent. Soon cases of toxicity were encountered and there began to appear in the literature reports of deaths from its use.

Early in 1935, a few patients who had been taking dinitrophenol began to get cataracts, and during the following year about fifty cases were reported. This was an unexpected complication—blindness as a result of slimming. The opacities in the lens begin beneath the capsule, spread through the cortex, and then the nucleus. The change is frequently quite rapid, the lens becoming completely opaque within a period of a few weeks. When the cataracts progress rapidly, there is apt to be a complicating glaucoma. The cataractous changes in the lens are a late manifestation of poison-

ing. In one reported series they occurred on an average of 15 months after the drug was first taken, and an average of 7 months after its use was discontinued. The cataracts, if uncomplicated by glaucoma, can be extracted by the usual operative methods with as good return of visual acuity as after extraction of other types of cataract.

Contact lenses, the so-called "invisible spectacles," have received considerable publicity during the past year, partly originating from the optical companies, partly from a few ambitious optometrists, and partly from health columns in the daily press. They are thin shells of glass worn on the surface of the eye, behind the lids. Physiological salt solution is used to fill the space between the glass and the eye.

These lenses are designed to be worn for the correction of irregular or high degrees of astigmatism or high myopia, especially when ordinary spectacles are not practicable. They have been most popular with actors and speakers who have large refractive errors, and who do not wish to be seen wearing glasses. In most cases they can be worn with comfort only for a few hours at a time. Putting one on and taking it off requires some skill, and is usually done over a bed where dropping will not break the thin shell of glass. A new one costs about \$50.00.

Contact lenses were made in Germany fifty years ago, the first ones of blown glass. Later, methods of grinding them out of hard glass were devised, and now they are fitted with trial sets of ten or more sample lenses of various curvatures, and the exact dimensions determined for each individual. Dallos has had contact lenses molded over casts made of the living eye, obtaining comfortable fits in asymmetrical or sensitive eyes. At present, contact lenses are not entirely satisfactory, and some persons who can see better with them, cannot wear them comfortably. Their field of usefulness is distinctly limited.

The care of the cross-eyed child continues to elicit its share of published articles. While the causes of strabismus remain uncertain, progress is being made in its treatment. During recent years many kinds of eye exercises have been tried, and now enough well-controlled work has been done with them in the large clinics to enable one to estimate their relative value. New instruments have been invented to aid in these exercises or to produce still other more complicated forms. The next few years will determine their relative merits. At present these fancy new instruments are most popular with the non-medical refractionists.

Modern ophthalmologists agree that the treatment of strabismus should be based on an outline about as follows:

1. Optical treatment.
2. Treatment of amblyopia.
3. Orthoptic training.
4. Operative treatment.

1. Refractive errors are corrected by proper glasses with the object of giving to each eye its best vision. Abraham suggests ignoring hypermetropia of less than three diopters and astigmatism of less than one-and-one-

half. Certainly a minor correction in a lens has little effect on strabismus.

2. Amblyopia, the poor vision in the squinting eye, is corrected as far as possible with glasses. An attempt is made to improve vision through use by covering the better eye and forcing the poorer eye to do the seeing. By this method in children three to four years of age, good vision can be developed in an amblyopic eye within a period of a few months. In older children years may be required for the same result.

3. The place for orthoptic training is subject to much disagreement. It includes forms of treatment which aim at establishing binocular and stereoscopic vision. By its methods the two eyes learn to work together. Because it requires much time and patience it is not as fully utilized as it might be by the busy ophthalmologist.

4. Operative treatment seems to be regarded by most authors as a last resort. Methods most advocated at present are recession of the attachment for weakening the effect of a muscle, and resection or advancement of the opposing muscle to strengthen it. All these operations can be graded and their results calculated in advance with fair accuracy. The chief disagreement over operative treatment arises as to the best time for performing it, whether between the ages of 3 and 6, or at adolescence. If one may judge from published reports, the earlier age is becoming more and more popular. In general, squints of more than 20 degrees in children will require operation; those of less than 20 degrees may be helped or cured by orthoptics.

Perhaps the best course to follow in the light of the knowledge available at present, is to give the cross-eyed child proper glasses, and the best vision possible in the squinting eye. After some orthoptic training, unless there is great and rapid improvement, lengthen or shorten the proper extra-ocular muscles, and then institute orthoptic training. The plan of watchful waiting in the hope that the patient may outgrow his squint is wrong. A small proportion of cross-eyed children do grow up with straight eyes without any treatment, but often at the expense of one poor eye and a lack of stereopsis. We have little knowledge of the factors that lead to these spontaneous cures.

There are a number of reasons for preferring to treat the children before the age of six. Vision can often be brought to normal limits within a few months. Orthoptic exercises are most effective at that age if the child will cooperate. Operation can be performed satisfactorily. It is not fair to a child to send him to school with an eye turned out of line. Children are notoriously cruel, and their jeers of "cross-eye" cause more misery than most of us realize.

Of the three topics herein discussed, the first is of only passing interest for dinitrophenol cataract should not be encountered in future years when the drug probably will not be used. Contact lenses have had a wave of publicity which is now subsiding. The care of the cross-eyed child is a problem that will be with us for a long time. The ophthalmologist's ideal is to get the eyes straight before the child begins school.

Progress In Pediatrics*

As Recorded in The Journal-Lancet and Minnesota Medicine

By

Chester A. Stewart, M. D.**

Minneapolis, Minnesota

THE following excerpts selected from articles published in THE JOURNAL-LANCET about five decades ago portray a few current and accepted views and practices of the physicians of that period, as well as some of their baffling unsolved problems.

JOURNAL-LANCET, 1881-85

Miscellaneous Subjects

"Concerning the ravages of that fearful disease, consumption, much has been done towards exterminating the germ, where it exists in child-birth, by rendering gymnastical exercises, swimming and singing obligatory, ventilation and heating in schools, prohibiting child labor in factories, and exercising a wholesome scrutiny and control over large manufacturing institutions where obnoxious substances are used. It is only in the United States that the disease, summer complaint, takes away so many little ones; and it is for the reason that the majority of the parents ignore the fact of the susceptibility of cow's milk in absorbing all foul gases and that, therefore, if they are not thoroughly sure about the source from which it is derived, it is the most dangerous thing to give children, especially in warm weather."

"Now as to the origins of true malarial disease. I think it may be assumed that their source is in the soil, which may impart a portion of its fungi to adjacent stagnant water, where they may be in very active form, but if the water is not drunk, it can do no harm, for the sporules will sink in the water as fast as they mature and die, and so can not be dried and then wafted to neighboring localities to infect the people; but, if under the influence of a long dry spell, the water recedes and leaves the shore to be sun dried, then the dried spores of the fungi may become light enough to be transported by air currents, and inaugurate an endemic disease of malarial origin. It is that disease called "trembles" when applied to cows, and "milk sickness" when applied to those who drank milk of the diseased cows, originated in the soil and contaminated stagnant waters of the prairies, which the cattle drank, and that the germs passed into the milk to reproduce the disease in the drinkers."

Vaccination

"There are several methods used in vaccinating, and several ingenious instruments invented for

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**Department of Pediatrics, University of Minnesota, Minneapolis.

vaccinating. In selecting a point on the arm, the region over the insertion of the deltoid, is the best, on account of the integument at that point, being kept more at rest than any other, because there are no muscular movements going on underneath, during the motions of the arm. The method practiced, consists in moistening the ivory point, if points are used, and when the virus is softened, smear it on the place selected, or if cones or crusts are used reduce the virus to the consistency of milk, and with the point of an ordinary thumb lancet, smear it in the same manner, and then passing the fingers and thumb of the left hand around the patient's arm, draw the skin tense transversely, and make fifteen to twenty-five scratches in the cuticle."

Diphtheria

"During the year last past I have had opportunity to observe 26 cases of malignant diphtheria, and some 15 or 20 cases of sore throat occurring in the same, or neighboring families, under circumstances peculiarly adapted to show its contagiousness. The above cases, though not numerous, would seem to point so far as they go: (1) That diphtheria is at least sometimes contagious. (2) That there may be very mild cases of diphtheria occurring even in the same family with the most malignant ones."

Meningitis

"The treatment of meningitis is important, and if employed early, the true character of the malady being early recognized, is satisfactory and attended with good results.

"Cases with violent onset will generally be treated without blood-letting, although, I believe this would be most efficient treatment in such cases, if practiced in the congestive stage, but we of more modern times make so little use of this sheet anchor remedy of the older school of practitioners, that we doubtlessly deprive our patient, in some cases, of the more potent remedy by the modern substitute by means of arterial sedatives and depressants.

"If called in the early stage it will generally be advisable to give a mild cathartic. If the pulse be accelerated and firm under the finger some arterial sedative should be given, and I prefer verat. virid (Norwood's), for with this you can bring the heart's action to any desired state and

hold it there as long as you deem advisable, weakening arterial tension hence active congestion of the cerebral capillaries. Apply cold to the head in the form of ice bags or bladders filled with ice. Iodid. Potas. should be commenced early and continued, the object being, at first, by it to prevent effusion and after effusion to promote its absorption.

"There is a brain trouble occurring in the course of gastro-intestinal diseases of infancy and childhood, that is regarded by many and spoken of and treated as meningeal inflammation, with effusion. This effusion is not of inflammatory origin, but is due to increased capacity in the cranial cavity; from atrophied and wasted cerebral substances, and as a result we have congestion of the cerebral sinuses and veins; together with effusion.

It is eminently important that the physician should comprehend the true pathology of this class of cases; for if he should regard them as a true meningeal inflammation and proceed to treat them as such they will most certainly prove fatal, while if they be treated as a state of exhaustion, giving freely of brandy, ammonia, quinia and concentrated liquid nourishment, he will often restore his little patient to health, after friends and all had relinquished the last hope of recovery."

Heliotherapy

"We are pleased to see that the profession is beginning to appreciate the great part which the sunbeam plays in promoting health, and now, it is not at all unusual to hear of patients being regularly subjected to sun baths for the purpose of restoring the victims of etiolation. Attention had already been directed to the subject, when Kilpatrick's blueglass craze broke out and disgusted the profession with the folly and credulity of the public, and the whole matter of sunbeam treatment was abandoned.

"Now, however, when the epidemic blueglass nonsense has gone the way of all similar fashionable follies, there is some prospect of reviving the rational treatment of anemic conditions by the sun bath, and numerous physicians are availing themselves of that potent factor in the treatment of anemia. Let the anemic lady's couch, or the child's crib be wheeled to the window, where in the state of perfect nudity, the sun can blaze in and thoroughly tan the hide and rubify the blood."

Rickets

"With a history of constipation, together with a flabbiness of the muscular tissues, taken in connection with a cough which is troublesome we

are justified in a diagnosis of rachitis, and especially so since we cannot find any other disease.

"As to treatment, I advise keeping the child in warm fresh air moistened a little with steam. The child should be washed twice daily in cold water with perhaps a little salt added. Then the baby should be weaned, for the character of the mother's milk has probably something to do with rachitis. Farinaceous food such as barley or oatmeal mixed with boiled cow's milk may be gradually substituted for the breast milk. It is thought by some that a superabundance of lactic acid in the stomach and intestines may prevent the bones from reaching their normal development, and the theory which explains this by the lac-tubes being washed out is a very plausible one. So too much milk is injurious by forming too much lactic acid. I generally do not give much medicine provided I can harden and toughen the baby by cold water bathing and proper food. Cod liver oil may be added in the winter to increase nutrition."

Germ Theory of Disease

"Why do different epidemic diseases vary in their intensity and fatality? The gentlemen who have so lately discovered that all these are caused by certain known and recognized bacillus, bacteria, or something of that sort might explain the reason why. Possibly these micro-beasts of prey are more ravenous, active or malignant at one time than another. We must all swallow Mr. Koch's or some other foreign gentleman's theory or be classed as ignorant, slow fogies. The past is strewn with forgotten dogmas and theories. Some of them were as brilliant as this, and ran away with some of the greatest minds."

Since the time the preceding articles were published great changes have taken place. Many of the views and medical practices of the comparatively recent past have been abandoned, and many of the problems of former days have been solved. Accompanying these changes medical publications have become progressively more scientific, and deal frequently with an increasing variety of topics unheard of by physicians who practiced a generation or so ago. More recent developments, views, practices, trends of thought and remaining unsolved problems may be illustrated by the following excerpts selected from papers which appeared in THE JOURNAL-LANCET and in MINNESOTA MEDICINE during 1933-4-5.

In these few excerpts selected from recent articles we find discussions of topics such as vitamins, pH, disturbance of the permeability of cell membranes as related to the abnormal "convulsive

reactivity" of epileptics, scarlet fever immunization, and the Dick test; all of which were unknown to the medical profession until comparatively recent times. These few selections, to which many more could be added, seem to illustrate how medical science has advanced in a relatively short period.

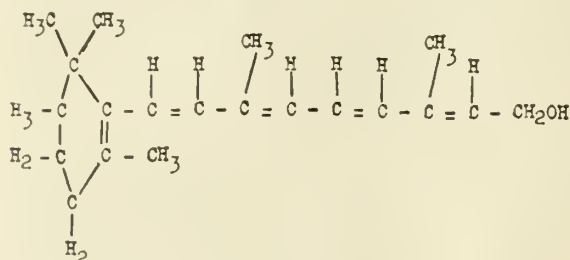
At the present time advances in medical science are being accomplished, apparently, with increasing rapidity, thus the physician needs correspondingly increasing facilities for keeping himself informed.

JOURNAL-LANCET and MINNESOTA MEDICINE
1933-35

Vitamins

"Great advances have been made in the past few years regarding the chemical nature of the vitamins. At least four have been isolated in chemically pure form and two of these have been synthesized in the laboratory. Vitamins A, B, C, and D have been isolated and vitamins A and C have been synthesized.

"Vitamin A is found to be one half a molecule of beta-carotene as follows



Infections of the Genito-Urinary Tract

"The administration of large amount of fluid and the bringing about of a urinary acidity sufficient to inhibit bacterial growth make an ideal combination, during the acute stage, with which to wash out the passages and prevent further growth of organisms in them.

"In more chronic cases my experience indicates that methenamine, used under controlled conditions, offers better chances of success than any of the other antiseptics. Gillespie has recently studied the bactericidal effect of Pyridium and Serenium, two newly introduced urinary antiseptics, and has not been able to show that they would be likely to be of any value in the treatment of infections with the colon bacillus. Experiments with methenamine in vitro, have shown that the degree of acidity is of utmost importance in successful treatment. Without accurate control of urinary acidity, methenamine may be of no more

use than so much water. At a pH of 6.0 and with a concentration of methenamine of 0.5 per cent, not enough antiseptic power developed in urine to kill the colon bacillus after 24 hours, but at a pH of 5.0 and one tenth the concentration just named, all organisms were killed within that time, and the same concentration rendered the urine sterile in six hours. By means of methyl red paper, which turns bright red at a pH of 5.5 and below, it is possible to determine whether urinary acidity is sufficient to split methenamine rapidly enough to produce bacteriostasis or even bacteriolysis in six to eight hours. Whether this suffices to clear up the infection, only trial will tell. If it will not, it is probable that urinary stasis is present in the system, and the cause of the stasis should be determined, if possible, by complete urologic examination."

Epilepsy

"That an inherent deficiency of this type (a disturbance in cell membrane permeability) may conceivably account for the abnormal "convulsive reactivity" of the epileptic person is further suggested by the circumstances, that most factors which favor the occurrence of seizures are also known to increase permeability of cell membranes; whereas, agents such as anesthetics and narcotics which cause their cessation, have the opposite effect. Should this conception prove on further study to be sound as regards its essential features, it is probable that a much more effective form of therapy than any now available will be developed from more deliberate attempts to correct or compensate for the existing defect."

Scarlet Fever Immunization

"No case of scarlet fever has occurred in the student nurses in the Central School of Nursing among those who had negative skin tests or who were immunized with five doses of scarlet toxin (Dick's), with the exception of a case in a student nurse who had had scarlet fever in childhood, whose Dick test was negative and who, therefore, had not been immunized. One case out of 690 nurses gives a rate of 1.4 per 1000. During the same period, there were seven cases of scarlet fever in a group of 619 affiliating nurses who had neither been Dick tested nor immunized. This gives a rate of 11.3 per 1000, eight times the incidence in the regular nurses who had been tested and immunized."

Vitamin A and Visual Acuity

"Vitamin A deficiency of sufficient degree to produce the well known and outspoken symptoms

CHRONOLOGIC ORDER OF THE APPEARANCE IN THE JOURNAL LANCET AND IN MINNESOTA
MEDICINE OF SELECTED NEW TOPICS OF IMPORTANCE IN PEDIATRICS

1881-1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935
Trache- otomy	Intubation. Condensed Milk.	Diphtheria Antitoxin.	Cod Liver Oil Modi- fications. Thyroid Therapy.	Tetanus Antitoxin. Adenoid- ectomy.	Pylorio- stenosis. Antimen- ingo-coccio Serum.	Von Pirquet Test. Bronchoscope. Tetany.	Mantoux Test. Radium for Nevi. Sinusitis.	Splenec- tomy. Diok Test. Convales- cent Measles Serum. Insulin. Lactic Acid Milk. Acrodynia.	Schick Test. Scarlet Fever and Diphtheria Soap Toxin. Undulant Fever. X-ray Treatment of Ery- sipelas.	Convales- cent Polio Serum. Scarlet Fever Serum. Para- thyroids.
	JOURNAL LANCET							Toxin- Antitoxin. Encephalo- grams. Vitamins. Scarlet Fever Immuniza- tion.	Helio- therapy.	Ketogenio Diet. Water Restriction Diet.

of this deficiency is rare in this country. We have no good idea of the prevalence of a moderate deficiency of this vitamin. In searching for a clinical measure of moderate vitamin A deficiency it occurred to us that night blindness might serve such a purpose. By means of a photometer we have determined the speed of recovery of acuity of vision after exposure to bright light. We have found that 20 per cent of the children applying to our children's hospital for treatment have a loss of visual acuity in the dark, and that the acuity of vision can be restored by cod liver oil administration. We believe that we have established the validity of this procedure as a method of determining vitamin A deficiency. We would attach no special significance to the incidence figures we have obtained up to now, except possibly that they permit us to state that in this particular class of children, moderate deficiency of vitamin A is relatively common. From this finding we would not draw the inference that vitamin A concentrates are indicated routinely in the every day feeding of children. It is our opinion that a good diet will supply an adequate amount of vitamin

A, and that, ordinarily, the use of a good diet is the better method of obtaining this vitamin."

Since 1881, the JOURNAL-LANCET has served uninterruptedly to place new knowledge and discoveries at the disposal of the doctors of the Northwest, and in this capacity it was joined by MINNESOTA MEDICINE in 1918. The services these two journals have rendered in the past in augmenting the dissemination of knowledge to the physicians of the north central states and elsewhere is illustrated by the following chart in which is recorded the chronological order of the appearance in each of these two journals of selected new topics and discoveries of special pediatric importance.

This chart discloses only a limited part of the important educational services these two publications have rendered in the past and in view of rapidity with which advances in medical sciences are being made, these two journals will doubtlessly become increasingly indispensable sources of post-graduate medical information in the future.

A Student Health Opportunity*

By

E. Lee Shrader, M. D.**

St. Louis, Mo.

MEDICINE has always been concerned with the sick; not the well. Most of the teaching in medical schools is still predominantly concerned with the care of the sick. And even throughout the profession as a whole there still exists a much keener interest in sickness than in health and its preservation. The attitude of the average practitioner of medicine, today, toward illness which fails to present very obvious deviations from the median norm, is rather passive. And patients with these unclassified symptom syndromes are quickly dismissed with little or no constructive advice for the alleviation of their problems. Our present concepts of human function, although great, have been accumulated incidentally or accidentally in, and primarily to aid in, our search for a cure or a better treatment of disease rather than a maintenance of health. The use of our knowledge of human function to preserve health is a relatively recent development. In brief, such was, and largely is today, the viewpoint of medicine both in professional teaching and practice.

As a more abundant knowledge of human disease has accumulated, a modest number of direct or indirect methods of prevention or control have appeared. Their effectiveness has depended largely upon the amount known about the specific nature of the disease, the peculiar mode of invasion and the exact manner of devitalization of the human body. It is in the realm of infectious diseases that prevention has been most successful. This phase of disease control began with the work of Pasteur, and has been rapidly and brilliantly expanded both in the investigative field and the practice of medicine by such workers as Koch, Lord Lister, and many others. Infectious disease control is based upon the protection of large masses of the population from the etiological agent by its elimination from human contact or its destruction; by mass immunization; by specific cures of those ill; but not by any precise individualization of health principles for any particular person. The average citizen today, all too frequently, does not appreciate how sanitation destroys the causative agent of disease by the purification of water, by rendering sewage innocuous, by preservation of food, and by protecting him from insect carriers of disease; nor how effectively by quarantine, physical inspection, by the exclusion of dangerous cases of illness at ports of entry, or by the study of, and the promulgation of, preventive programs against domestic diseases, the United States Public Health Service protects the nation from epidemics of such diseases as bubonic plague, cholera, undulant fever, psitticosis, and the like. So also, do the local health departments contribute their "bit" in the sani-

tary campaign against infectious diseases. It is now within our power to make smallpox, diphtheria, typhoid fever and tetanus clinical curiosities by mass immunization. In clinical medicine cures by antitoxins and sera, in biochemistry and nutrition triumphs over pellagra, scurvy, and others have also added to the conservation and prolongation of life.

The profession and the public have accepted many recognized principles of disease control or prevention with great scepticism and indifference, particularly in their early practical application. Medical history abounds with these incidents. The introduction of smallpox vaccination by Jenner produced bitter antagonism in medical circles and even today is often violently opposed by some of the public. One need not mention the abuse and vituperation with which Pasteur's theories were at first received. So, we see, there is still much to be done for a more thorough application of our present knowledge for the conservation of life both professionally and educationally, and still much more for medicine to do in the realm of those still unconquered infectious diseases.

In clinical medicine there has been some progress made in the conservation of life. Persistent investigation has defined specific modes of treatment, although not preventive or curative, in Addison's disease, pernicious anemia, and diabetes. In a great many other infections and illnesses while no specific cure or control has been elaborated, better understanding of human pathological processes has shown it feasible to apply general principles commonly called "good nursing care" to increase the natural human resistance with gratifying results. In a few instances, the correlation of nutrition and pathology, as in typhoid fever, has provided an effective dietary program, reducing the length of the illness by at least one-half and increasing the chances for life many fold. In fact, today it is not uncommon for a typhoid patient to be in better health upon recovery than he was prior to his infection. Thus illustrating that a knowledge of the mode of human devitalization by an infectious disease makes effective mass methods of treatment, although not specific, for life conservation.

In general, however, outside of the realm of infectious disease, medicine has achieved only indifferent results in prevention and control of sickness. Better treatment, earlier diagnosis, and the periodic health examination have been hopefully applied, but with somewhat depressing achievements; and yet this is not surprising when we remember that we have applied pathological methods of detection to human biological problems which probably have their origin in physiological deviations from the median norm.

Improved clinical treatment has been accompanied by ever-increasing effectiveness in clinical diagnosis and *vice versa*. Each has been a corollary of the other. Among

*Presidential address, Seventeenth Annual Meeting, American Student Health Association, Washington, D. C., December 30, 1936.

**Director, St. Louis University Student Health Service, St. Louis, Missouri.

the various methods of more exact diagnosis sought and developed, one only need mention the X-ray, bacteriological and serological laboratories, the clinical use of biochemical methods in the study of blood and other body fluids and excreta. Today, the use of these aids to early diagnosis is a very common practice while half a century ago it was rare. The earlier the diagnosis the more successful is the treatment. An excellent example of this is in the case of tuberculosis. Where detected in the asymptomatic stage, the cure is almost a certainty. Not only have better methods of diagnosis increased our ability to detect early disease; but they have focused our attention on the human mechanism as a whole. This has led medical men to think of, and to include the entire human body in, their diagnostic search for pathology. When one has a pain in the abdomen the medical practitioner does not limit his study to the investigation of the abdomen or questions about the diet. For he knows that neurological derangement, pulmonary pathology, vascular diseases, and many other things may be the cause of the patient's complaints. And, in turn, this has again increased the possibilities of early diagnosis. Because earlier diagnosis has been possible and because treatment has been more successful in earlier stages of disease, medical minds have been eager to make diagnoses in asymptomatic stages of illnesses. This has suggested the periodic health survey, to determine the presence or absence of that ambiguous concept we call health.

In the past few years, the periodic health examination has been well-advertised and well-practiced. Its principle is early detection of pathology for the purpose of arresting it early, or delaying its rate of progress. It has been applied most enthusiastically in insurance and industrial medicine and student health services. The best statistical claims for its successful application are in insurance medicine. Several years ago, the Life Extension Institute reported an astonishingly lower death-rate among life insurance policy-holders who received the periodic health examination as compared with those who did not. I question the validity of these claims. For these examinations were offered to policy-holders; but were not *arbitrarily* forced on one group and denied the other. The policy-holder who was not health-minded or already ill and under medical care probably did not avail himself of the examination. While on the other hand those who accepted it were probably much more healthy and, therefore more health-minded than the average. I think it has been a useful principle and has done much good but I question whether its value is as great as the statistical claims for it would indicate. It has made us aware pathology often exists long before the patient is symptomatically conscious of it. When the health audit reveals familiar pathological syndromes for which a cure or treatment is known, it is decidedly beneficial. But all too frequently the findings are too incomplete, conflicting, or inconclusive to be pathologically classified, *for they are not entirely pathological*; but are in that as yet unexplored twilight zone where functional and structural changes intermingle.

From a biological viewpoint, functional changes from the median must be conceived as preceding structural deviations. Whether such disturbances originate as biochemical, or in a more gross physiological way, is still speculative. Speculative, however, only because of a lack of definite evidence to support our thoughts. We do not know exactly how or when persistent median functional deviations will or do evolve into definite pathology. Our ability to visualize and classify impending clinical trends has not kept pace with our diagnostic art. We have pushed back the frontier of illness from the gross to those more subtle asymptomatic and finally to the hazy and as yet ill-defined meeting ground of structure and function. We are still structurally not functionally-minded. We are still more interested in illness and are only now become health-conscious. Our clinical methods of investigating disease (or health if you wish) are still designed to disclose established pathology. They need more physiological refinement to clarify the twilight zone where function and structure meet.

I think this thought can be more clearly illustrated by a study of vital statistic tables. As the mortality from infectious, nutritional and other diseases has decreased to lower ranks in the lists of the causes of death, the so-called degenerative diseases have progressively marched upward to higher and higher ranks. The entire public health and preventive medical program, including the periodic health examination have not contributed very much to the prevention or control of these degenerative diseases.

It would seem that the etiological factors in vascular disease, duodenal ulcer, gallbladder disease, renal stones and a host of similar human health problems, must be both intrinsic and extrinsic to the individual. The inherent weakness would seem to be hereditary, congenital and constitutional, the environmental related to customs, habits, and occupations. There would appear to be, however, no sharp division between the intrinsic and extrinsic, for I think it is quite clear that each may influence the other. Their evaluation awaits better physiological diagnostic technic, and better vision of their implications in clinical physiology.

Certain approaches to this field of human biology have already been made. Perhaps the work of Draper, Kretchmer, and others on the constitutional relations of man to disease is more significant than has been realized. Perhaps we should heed Holmes' advice on how to live a long life. The investigations of Pearl indicate that heredity is astonishingly significant in those persons who live long lives and are free from premature degenerative diseases and *vice versa*. He even goes so far as to hint that given a good heredity background for longevity, our bad habits will have a most insignificant effect on our chances of becoming an octogenarian. Possibly more intense medical interest in the social, vocational and occupational influences on human function would provide useful information about the extrinsic causation of degenerative disease.

This potential field of medicine should have a peculiar interest for the student health physician. The death curve from degenerative diseases starts its upward rise slightly before the age of 30. The age of college students is only a few years less. Should there not be some evidence at the college-age level which should indicate future health trends? Could not intensive clinical physiological study of college students be valuable in establishing a clearer insight into the significance of early median functional deviations? Is there any future health meaning in a slight persistent or recurring albuminuria or glycosuria, sub-clinical elevations or depressions of blood pressure, undue fatigue, vague gastric ulcer-"like" syndromes, abnormalities of nutrition and a host of other clinical pictures found in student health records; clinical pictures never clearly classified, despite an honest, earnest effort to do so? Should it not be possible for this information to be used intelligently in preparing a specific health program for a specific individual with a specific heredity, a specific constitutional mosaic, in a specific social, occupational situation for a

longer, more successful, more healthful life? For example, if given a certain type of personality, a medical career may exact a great deal more vitality than one of law or commerce and finance, and jeopardize either health or success or both. It is not enough for us to await the advent of actual pathology before giving advice for the prolongation of life. This problem should be attacked when still functional. In order that the student health physician can intelligently and accurately direct his efforts toward the study of degenerative processes in their early median norm deviations, it is not enough that he be a specialist in clinical physiology and medicine of the college years. He must broaden his clinical and biological knowledge to include a keen appreciation of the clinical pathological picture of degenerative disease as it occurs at the older ages.

In other words, the future in health practice and teaching must include a program for specific planning of health and hygiene habits for specific personalities with specific problems in a specific environment of life.

BOOK NOTICES

FROM THE COMMONWEALTH FUND

Rural Health Practice, by HARRY S. MUSTARD, M. D.: 1st edition, heavy red cloth, gold-stamped, 578 pages plus index, 31 tables, 28 figures; New York City: The Commonwealth Fund: 1936. Price \$4.00.

In this book, rural health matters are discussed under the topics: vital statistics, school health service, maternity and child hygiene, communicable diseases, syphilis, tuberculosis and rural sanitation. The author advocates organization of county health units under state health departments as the ideal approach to all these problems. Cooperation between these groups and local practitioners or health units is strongly recommended. However, no definite integration of the family physicians in such a program is outlined.

Though embracing many admirable features, this volume depicts the socio-economic views championed by the Commonwealth Fund and the foundations, all of which are inimical to organized medicine. It should be borne in mind that such recent movements as the county health unit, first organized in 1908 or 1911, are not accredited with adding 12 years to human longevity during the past quarter century. Nor is such a recent trend responsible for making the United States the most healthful of all civilized countries. These accomplishments are properly attributed to our present system of medical practice. Should state and county health departments threaten the life of a profession which has stood the test of centuries and contributed more to human life and happiness than any other? This is the dominant challenge of this book.

EDUCATION IN AMERICA

The Higher Learning in America, by ROBERT MAYNARD HUTCHINS, Ph. D.; second edition, 119 pages, no illustrations, no index, three-quarter boards, library labels; New Haven, Connecticut: The Yale University Press: 1936. Price, \$2.00.

This book comprises the 1936 Storrs Lectures of Yale University, given this year by the president of the University of Chicago. It is the first truly penetrating analysis of present-day education in America that has appeared; and to say that it is admirable is to understate its excellence.

President HUTCHINS leaves no stone unturned in his search for the ultimate objective of the higher learning; neither does he shrink from cracking heads when heads ought to be cracked.

Professors are arraigned as unemotionally as are alumni—and in late years, it has been exceedingly difficult to discover which of the two groups is most detrimental to the true ideal of the university.

The only criticism THE JOURNAL-LANCET has to offer is that this little volume will not be read extensively enough. It is a pity, for such agile but effective dissections of our educational dilemma do not appear every week.

POPULAR EDITION OF CLENDENING

Health Chats, by LOGAN CLENDENING, M. D.; first edition in book form, heavy green fabrikoid, gold-stamped, 390 pages, no index, no bibliography, line cut illustrations; Philadelphia: The David McKay Company: 1936. Price, \$2.50.

This is the popular edition of LOGAN CLENDENING's newspaper articles which he has been writing for the King Features Syndicate, and which are familiar to all physicians. The work is new in the sense that these articles have been collected and put in book-form; otherwise, they are not new.

It is impossible to present an encompassing review of this volume, because Dr. CLENDENING has actually produced a medical *potpourri*. The reader may thrust his attention in at any point, and pull out a spicy plum. Nearly every subject imaginable is mentioned; few, of course, are treated at any length.

The style is felicitous and the content is sound. THE JOURNAL-LANCET is willing to recommend this volume.

FORGOTTEN MEN OF SCIENCE

Trail-Blazers of Science, by MARTIN GUMPERT, M. D.; first American edition, cloth, 306 pages plus index; New York City: Funk & Wagnalls Company: 1936. Price, \$2.50.

This is not a new book, but it is new to America. The author is a German scientist who is living in this country, and shortly will become a naturalized citizen.

Herein the reader will find the story of MAX JOSEPH PETTENKOFER, who swallowed cholera bacilli, yet lived. Herein, too, is the tale of ROBERT MAYER, who evolved the law of the conservation of energy. JEAN LAMARCK, held by some to be the true founder of the revolutionary theory, is presented in this volume. There is a section devoted to HARVEY CUSHING, foremost American brain surgeon.

The book recounts the experiences of world scientists who for one cause or another (usually abysmal bigotry and ignorance) were compelled to pursue their research under duress and privation. It is in this respect a unique volume. While not exhaustive, it is scientifically and historically accurate. THE JOURNAL-LANCET is able to recommend this popular volume.

The JOURNAL LANCET

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South Dakota State Medical Association
Montana State Medical Association

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SIXTY-SIX YEARS

It is with satisfaction that THE JOURNAL-LANCET calls attention in this anniversary number to the completion of sixty-six years of medical journalism in Minnesota. In the sixtieth anniversary number, dated February 1, 1931, Dr. William Davis, of St. Paul, who was for many years associated with Dr. Alex J. Stone in the editorial management of *The Northwestern Lancet*, outlined briefly the connection between the present JOURNAL-LANCET and the first medical journal in this state. The facts herewith cited are from Dr. Davis' account.

Dr. Alex J. Stone in 1870 published the first number of the monthly journal of twenty-four pages, called *The Northwestern Medical and Surgical Journal*. That Minnesota could arrogate to itself the title "Northwestern" seems odd to us now, when we contemplate the great states and populations in the thousands of miles of empire lying to the north and west of the Twin Cities. At that time, however, the only other state in the region was Oregon, which had been admitted to the Union in 1859, the year following the admission of Minnesota as a state. It was not until 1889, *i. e.*, nineteen years after the event we celebrate, that North and South Dakota, Montana and Washington were admitted as states of the Union; and Idaho was admitted in 1890.

At the time, settlement was sparse, communications difficult and slow, a railroad had only recently come through from Chicago, and Minnesota had a population of less than half-a-million people. Dr. Stone carried

on this primitive and struggling journal for two years, when Dr. H. C. Hand of St. Paul and Dr. H. H. Kimball, of Minneapolis, took it over and carried it for two years longer, *i. e.*, until June of 1874, when as Dr. Davis said, "It died of inanition, starved by a lack of subscribers and advertisements. Realizing how few must have been its subscribers, and looking over the scanty advertising, it is remarkable that it survived for four years."

The next medical journal to appear in Minnesota was *The Northwestern Lancet*, the first number appearing October 1, 1881. It appeared semi-monthly, was owned and edited by Dr. Jay Owens, of St. Paul, who turned over the editorship to Dr. C. B. Witherle, of St. Paul, in November, 1884. Dr. Stone reappears in this history through his purchase of *The Northwestern Lancet* in September of 1886. Later, as will be shown, *The Northwestern Lancet* became THE JOURNAL-LANCET, and it is through Dr. Stone that the complete succession of *The Northwestern Medical and Surgical Journal* of 1870, through *The Northwestern Lancet* to THE JOURNAL-LANCET, becomes established.

Almost immediately after his acquisition, Dr. Stone turned over the active work of editing the journal to the associate editor, Dr. William Davis. This arrangement continued through the year 1899. During 1900, Dr. Howard Lankester, of St. Paul, acted as associate editor, and in 1901 the thirty years of service of Dr. William A. Jones, of Minneapolis, as editor, began. In 1912 the

title was changed from *Northwestern Lancet* to *THE JOURNAL-LANCET*, in order that the name of the first, the pioneer journal, might be included. The long and notable service of Dr. Jones as editor has been memorialized by Dr. Arthur S. Hamilton in *THE JOURNAL-LANCET* of February 1, 1931; and this same number has a remarkable portrait of Dr. Jones, who died on January 15th of that year. Dr. Hamilton brings out well the character of the man; his clinical acumen, his abounding friendliness and helpfulness, his easy diction and ready wit, his forceful personality, his love of music and of work. During the thirty years of his incumbency the editorials of Dr. Jones were eagerly sought and widely read, although the journal served the interests and special medical activities of a limited geographical area.

With the death of Dr. Jones, the present board of editors, with Dr. J. A. Myers as chairman and editor-in-chief, has carried on with a determination to make *THE JOURNAL-LANCET* more and more a force for good medical journalism in the territory it serves. A notable departure has been the issuance of special numbers on timely and well-chosen topics designed to bring before the practitioner in medicine the latest knowledge in the field by able exponents. The titles of these special numbers need not be enumerated. The idea has been well received and widely acclaimed, and the publication of these special timely numbers will be continued.

If *THE JOURNAL-LANCET* were a woman, it would by now be trying to hide its age. Being what it is, its pride grows with each anniversary, and its editor-in-chief and board of editors resolve anew that each year shall see a more and more effective service to its constituency.

S. M. W.

ANNUAL REVIEW OF LITERATURE

In this issue, *THE JOURNAL-LANCET* presents for the first time in its history an annual review of the past year's medical literature in most of the chief fields of medicine. There is a review of general medicine, of obstetrics and gynecology, of surgery, of proctology, of the ear, nose, throat, and bronchoscopy, of ophthalmology, and of pediatrics.

This is the first time such a review has been considered by *THE JOURNAL-LANCET*, or, for that matter, by any state medical journal within the knowledge of the editors. But the idea is sound, and the value of these reviews cannot be underestimated.

They do not, of course, seek to displace in any manner the customary medical article published in the journals of the country. It is felt that by offering to the readers of *THE JOURNAL-LANCET* an opportunity to learn of the many important advances made in medicine during 1936, these reviews serve a definite purpose which more than justifies the time and labor expended in their preparation.

Neither are these reviews exhaustive in scope. With so limited space available, it is folly to assume that all the advances made during one year's time, and reported in hundreds of journals, can be compressed within the covers of a single issue of *THE JOURNAL-LANCET*. However, since the fields covered by these reviews have been evaluated so circumspectly by the reviewers, it is believed that the most salient articles have been included, even though it may have been necessary to slight many minor and relatively unimportant articles in each field.

Many readers will agree with the editors that these reviews are almost unique in the periphery of the state medical journal, and that the practice of presenting them is a valuable service to the physician.

J. A. M.

DO WHAT YOU CAN

Physicians, wherever they are or whither they go, are frequently embarrassed by the lack of some instrument or equipment that would appear indispensable in a given emergency.

When our forces entered the World War, there was naturally much confusion in the beginning due to haste. In *From a Surgeon's Journal* are related some of the vexing problems that confronted medical staffs when they arrived at their assignments before the necessary working supplies.

At a conference in Paris, Harvey Cushing suggested a motto "Do what you can, with what you've got, right where you are." Why isn't that a good rule to live by at all times? It's an actual and practical religion. Conscientious devotion to the principles of our profession calls for that very thing under all circumstances. Presence at an accident where first aid kit and other tools are lacking, is no excuse for helpless inactivity. Here is a test in the application of empty-handed ingenuity to the saving of a life. Pioneer resourcefulness even before the patient can be moved may determine the outcome. It is nice to have rubber gloves, X-ray and laboratory reports, but whether or not, we are still fulfilling our duty when we *do what we can, where we are with what we have*.

A. E. H.

OSCAR E. LOCKEN, M. D.

With the death of Dr. Oscar E. Locken of Crookston the family, associates, community, and the medical profession have sustained a loss that cannot be fully replaced.

To his family as husband and father he was what every family man should desire to be. In his practice he was not only a student of medicine, but possessed those rare characteristics which combine to make him a valuable man not only to his patients but especially to his associates with whom he worked. In addition to his devotion to his family, associates and patients, he found time to render invaluable service to the affairs of his

community. During his six years as mayor of Crookston, he was an active mayor and instituted changes of permanent value to the city. He served for three years as city health officer and during this time sacrificed much time and energy in improving the health conditions of his home city.

Nor were his energies and sacrifices confined to his own immediate community. He was rapidly becoming one of the most valuable medical men so far as health and the practice of medicine was concerned.

He served as vice president of the Minnesota Public Health Association for several years. During this time his ability as a public speaker and his ingenuity in handling practical problems in the relation of the medical profession to the public were well demonstrated. Perhaps no medical man in the state possessed so rare judgment in convincing the public that their medical problems and those of the medical profession were synonymous. His speech before the assembled county commissioners stressing the patient-physician relationship, marked him as a most valuable liaison official for the promotion of this idea. This speech was used throughout the state for the instruction of county commissioners and others who had charge of federal or state medical aid.

He was a member of the state planning board committee on social economics and a member of the board of certification of public health nurses. Last year a new office was created in the State Medical Society. This new office was speaker of the house of delegates. On account of his sense of justice, fairness, general knowledge of medical matters, good judgment, ability to make decisions quickly, and express his ideas without hesitation, he was unanimously chosen as the first man to hold this office.

His success in filling this newly created office during the past year, not only gave the association the assurance that it should be continued, but that he should be the occupant of this office so long as he wished to retain it.

Dr. Locken was 45 years old. He died Monday, January 18th after an illness of ten days with pneumonia. He was a member of the North West Clinic of Crookston, of which he was one of the founders in 1920. He leaves a wife, one son, two daughters. Funeral held at Crookston, January 21, 1937.

SOCIETIES

PROCEEDINGS

MINNESOTA ACADEMY OF MEDICINE

Meeting of November 11, 1936

The Minnesota Academy of Medicine held its regular monthly meeting at the Town & Country Club on Wednesday evening, November 11, 1936. The meeting was called to order by the President, Dr. Thomas S. Roberts. There were 47 members and 1 guest present.

Minutes of the October meeting were read and approved.

Upon ballot the following men were elected as candidates for Active Membership in the Academy:

Dr. E. A. Regnier	Minneapolis
Dr. Justus Ohage	St. Paul
Dr. Gordon A. Kamman	St. Paul

Dr. Carl B. Drake read the following Memorial to Dr. H. T. Nippert and a motion was passed that it be spread upon the records of the Academy and a copy sent to the family.

Dr. HENRY THEODORE NIPPERT, known to his more intimate friends as Nip, was born in Heilbron, Wurtemberg, Germany, on February 12, 1868, the son of Reverend Dr. Louis Nippert and Adelaid Lindemann Nippert. His father was an American citizen and was sent to Germany by the Methodist Church to promote Methodism in Germany and Switzerland. Henry Nippert received his early education at Frankfurt-on-Main, graduating from the gymnasium at the age of seventeen, which accounts for his somewhat German accent and his frequently having been taken for a German. On the family's return to America in 1886, he came to Minneapolis where his brother, the late Dr. Louis Nippert, had already begun practice and obtained a job as a drugstore clerk which position he held for a year and a half. He then moved to Cincinnati and after two years of study obtained the degree of Ph. G. from the Cincinnati College of Pharmacy. Soon thereafter he began the study of Medicine at the Miami Medical College, a department of the University of Cincinnati, where he was graduated in 1891. He took his internship at the Cincinnati General Hospital.

On August 2, 1893, Henry Nippert was married to Bertha Elizabeth Wendt, of Newport, Kentucky, and began practice in St. Paul. That same year he joined the Ramsey County Medical Society and was president of the Society in 1916. For twenty-five years he had a medical service at the Ancker Hospital and gave clinics to students of the Hamline and University Medical Schools, resigning from the staff in 1919 in favor of younger members of the profession. Henry Nippert joined the Minnesota Academy of Medicine in 1916 and read his thesis "Empyema in Infancy and Childhood" on May 10, 1916, the paper having been published in the St. Paul Medical Journal the same year (Vol. 18, p. 270, 1916).

Henry Nippert died on July 4th, 1936, while taking a swim at his summer home on Big Sand Lake. He is survived by his widow; three daughters, Mrs. Vernon D. E. Smith and Mrs. John B. McGrath of St. Paul, and Mrs. Arnulf Ueland of Minneapolis, a son, Carl L. Nippert, of St. Paul; two brothers, Dr. Edward Nippert of Los Angeles and Judge Alfred K. Nippert, of Cincinnati; three sisters, Mrs. Louis Hemlings of Seattle, and the Misses Eleanor and Mary Nippert of Cincinnati.

Henry Nippert had a very high degree of personal integrity. He was exceedingly frank with his patients where the limitations of therapy were obvious and in every way was a very practical man. His patients, who, particularly in his early years of practice were largely among the German element of St. Paul, trusted him and regarded him as a friend because of the real sympathy he showed them.

One of his outstanding qualities was his keen sense of humor. He loved a practical joke and could always see the humorous side of a situation. He was a convivial soul.

He loved the country and enjoyed to the utmost the summer months spent at his cabin on Big Sand Lake in northern Minnesota with his family.

Although he never contributed a great deal to medical societies, he was a regular attendant and made staunch friends among his colleagues. He was tolerant of those who held opinions differing from his own and was most considerate of those younger and less experienced in the practice of medicine.

His philosophy towards life, his devotion to his country, friends and profession are well portrayed in the account of his life written by himself some time before his death, which was read at his funeral and published in the August number of the State Journal.

The Minnesota Academy of Medicine has lost one of its

best loved members. The society's sincere sympathy is extended to his bereaved family.

(Signed) The Committee:
FRANK E. BURCH,
WM. DAVIS,
CARL B. DRAKE, *Chairman*.

The scientific program followed.

ASEPTIC URETERO-SIGMOIDOSTOMY

A New Method Providing Definite Asepsis in Respect to Both Fecal and Urinous Soiling

by
FREDERIC E. B. FOLEY,
ST. PAUL, MINNESOTA

Synopsis

There is no general agreement concerning the importance of fecal soiling in operations for anastomosis of ureter with bowel. It is certain this factor is of some consequence and may on occasions determine a fatal outcome.

Avoidance of fecal soiling may be of importance in one or both of two ways. First of these is prevention of infection of the peritoneum and the risk of peritonitis incident to it. Second, and perhaps of greater importance as an object of asepsis, is prevention of infection of tissues at the site of anastomosis and impairment of repair processes incident to it. In the repair process of union between the ureter and the layers of bowel wall, primary union with absence of inflammatory infiltration and cicatrization resulting from infection should be considered desirable for production of a functioning one-way valve and avoidance of urinary obstruction by contraction of the stoma.

Most writers have appeared to think of "aseptic anastomosis" in terms only of avoiding contamination by bowel content and have appeared to regard soiling by urine content as of no importance. There is no assurance that soiling by infected urine does not have importance similar to that of fecal soiling and in these same ways.

Coffey's description of his "Technic No. 3" refers to it as an aseptic method. Quite obviously neither this method nor Higgins' extension of it is aseptic. In both methods a "transfixion suture" embracing ureter and bowel walls is tied tightly and establishes a fistulous communication by sloughing through both walls. In placing this suture it passes into and out of both ureter and bowel lumina and contaminates the site of union with both ureter and bowel contents.

The method of Poth more closely approximates definite asepsis but does not give positive protection in this direction. Description and illustration of the method as employed in experimental animals shows it to be entirely too troublesome and cumbersome for clinical use.

The method described here and illustrated by lantern slides is definitely aseptic in respect of both fecal and urinous soiling. It involves use of a newly devised and very simple snare or guillotine instrument within the bowel lumen. With the bowel submucosa exposed by longitudinal incision of the muscularis, the ligated end of ureter, pushing a small invaginated tent of bowel submucosa before it, is inserted into the snare. The two structures are held in the grip of the snare while the ureter is imbedded in the bowel wall by suture and the abdomen closed, all of which is accomplished without even a suture needle penetrating the lumen of either bowel or ureter. After an interval of time allowed for the tissue spaces at the site of transplant to become sealed off, a cutting current is supplied to the instrument as the snare amputates within the bowel lumen the ligated ureter end and invaginated tent of bowel submucosa covering it, thus establishing the uretero-intestinal communication.

The instrument and method have been employed in one case reported in summary as follows:

Ancker Hospital No. A 450 096. The patient was a female, aged 62. There was extensive carcinoma of urethra with invasion of vesical neck and trigone. Complete retention of urine was present; and there was diminished phthalein excretion, also nitrogen retention. Excretory urography showed normal pelvis

and ureters. The urethra was dilated and constant drainage with an indwelling catheter improved the renal function and general condition. Irradiation with radium element gave no favorable effect.

Bilateral transplantation of the ureters with a view to total cystectomy was determined upon.

On Dec. 3, 1935, the right ureter was transplanted by the method described. The procedure was executed with perfect facility. The submucosal tent and ureter end were amputated four hours later. Urine came from the bowel on the third day. General condition was excellent on the eleventh day. Temperature elevation and signs of bronchopneumonia were evident on the twelfth day. The patient died of bronchopneumonia on the fifteenth day.

Postmortem examination showed excellent healing and union at the site of transplant, no peritoneal exudate or infiltration and no dilatation of the ureter or kidney pelvis.

Discussion

DR. ARNOLD SCHWYZER (St. Paul): This method looks quite typical of Dr. Foley—it is neat in conception. Nevertheless the other methods are less complicated and gave me good results. I wonder whether with this instrument we would not get a stricture through the cauterization of the end of the ureter. I think for those of us who have operated much on the large intestine, a fine thread running through the mucosa of the gut would not mean very great danger of spreading infection, especially as long as there is drainage along the thread right into the gut. In order to avoid a stricture at the ureteral opening I have cut the ureter on a slant. The side with the tip was placed toward the lumen of the gut. In this way it somewhat protects the opening (for the first days). Again I wonder whether it would not be possible to have any mishap with this method. The patient might move around while the instrument is in place. Another question comes up: whether the end of the ureter protrudes far enough into the gut to insure against a certain amount of retraction which will follow. Notwithstanding these uncertainties, which practical experience has to decide, the procedure has neat asepsis to its credit.

DR. FOLEY (in closing): By way of reply to Dr. Schwyzer's criticism of the method I want to say that it is not cumbersome. By comparison with the usual method of transplanting the ureter to bowel, this instrument and method actually facilitate the procedure. Having the ligated end of ureter held transfix to the bowel wall in the grip of the instrument is considerably more convenient than inserting it through a stab opening in the submucosa and then placing the fixation sutures without the ureter held in place.

Dr. Schwyzer refers to the results of uretero-sigmoidostomy by usual methods as perfectly satisfactory. This opinion is not generally shared. The immediate operative mortality is out of proportion to the magnitude of the procedure. Most reports are based on cases in which operation has been performed according to a uniform technic planned to establish a functioning one-way valve. In spite of a uniform method being employed in the cases of a series, the results among the cases are not uniformly good. There is considerable evidence to show that the eventual end result depends on whether or not a good functioning one-way valve has been produced by operation. In the presence of satisfactory valve function the ureter and pelvis do not dilate, the kidney does not become infected and functions normally; in the absence of valve function or in the presence of cicatrization or obstruction at this site the ureter and pelvis dilate, the kidney becomes infected and finally functionless. It seems to me not unlikely that infection of tissues at the site of transplant is an important factor in determining whether or not a functioning valve will result. With cicatrization and scarring the result of infection, I would expect either a poorly-functioning valve or obstruction. An aseptic method may diminish the incidence of peritonitis; but its real value, if any, appears to me to lie in avoiding infection of the site of transplant, and inflammatory thickening of the valve-forming tissues incident to this infection. Such changes occurring with non-aseptic methods appear to be probably responsible for the poor results.

I have offered the method at this time and without substantial clinical experience to endorse it, because I do not have opportunity for animal experimentation and only a very small clinical material, and in the hope that others with better opportunity than mine in these directions will undertake to determine what the value and uses of the method may be.

EXTENSIVE THROMBOPHLEBITIS COMPLICATING MASTOIDITIS

by

DRS. MARTIN NORDLAND AND WALTER E. CAMP
MINNEAPOLIS

Lantern slides were shown to demonstrate the anatomy and the operative procedures involved. (Paper to be published in full later.)

Summary

During the past year the authors had the privilege of seeing two cases of extensive thrombophlebitis of the cranial venous sinuses and internal jugular vein, complicating acute mastoiditis. One of these cases died and the other recovered. The cases are reported in detail because of the interesting problems in diagnosis and pathogenesis.

Sinus thrombophlebitis is one of the most common complications of mastoiditis. The incidence of this complication in both acute and chronic mastoiditis, as reported in several large series of cases in the literature, is about 3.5 per cent. The thrombosis may be manifest, latent or develop postoperatively. Both of our cases were of the manifest type, *i. e.*, present at the time of operation. In one case there was definite evidence of thrombosis at the time of operation. In the other, the diagnosis was suspected because of the clinical findings and X-ray studies, but was not confirmed until operation. In one of the cases the thrombosis was of the *retrograde* type extending against the blood current; in the other it extended with the blood current into the internal jugular vein down as far as the subclavian vein.

The first case was that of a man 44 years of age, who came for examination December 9, 1935, complaining of a sore throat and earache in the right ear. His illness had begun three days previous, with sudden onset of fever, vomiting and diarrhea, sore throat and earache. Examination showed an acute bilateral follicular tonsillitis with exudate on both tonsils. The right ear drum was congested, edematous and showed a spontaneous rupture with serosanguinous exudate. There was tenderness over the mastoid and tenderness over the glands of the neck on each side. Temperature was 101.5°. Three days later he developed severe chills which lasted for four days. Following the chills he developed pain in the chest and right hip. He was placed in a hospital where he was treated by his family physician, until January 10, 1936 (about one month following the onset of his illness), when he was again seen.

During his stay in the hospital he had had continuous headache for two weeks, having a typical septic temperature the first week ranging from normal in the morning to 102° to 103° in the late afternoon. Chills were frequent but not daily. Examination at this time showed a purulent exudate from the right ear, the drum was thickened, but not bulging. There was no mastoid tenderness, but there was tenderness over both jugulars. The patient stated that there had been some swelling in the right neck which had now receded. There was pain in the right hip, but no swelling. Ophthalmoscopic examination showed bilateral papilledema of about three diopters with small petechial hemorrhages in both retinæ. White blood count was 20,000 with 86 per cent neutrophils. X-ray of the mastoids showed dense bilateral sclerosis of all cells and was of little help in diagnosis. Blood culture after six days was negative. Spinal puncture showed a marked increase in intracranial pressure. The fluid was not clear, with 43 cells per cu. mm. Tobey-Ayers test was positive on the right, showing occlusion of the right lateral sinus or jugular vein.

A diagnosis of subacute mastoiditis, right ear, with sinus thrombophlebitis, septicemia, and probable brain abscess was made, and on January 12, 1936, the internal jugular was exposed and ligated and the right mastoid was explored. The

cortex and mastoid cells were sclerotic, the mastoid antrum was small and filled with pus and granulations. A small perisinus abscess was found on the lateral sinus near the bulb. Aspiration of the sinus with a large needle showed no blood in the sinus. The lateral sinus was widely exposed and opened. A large clot extending down to the bulb and upward and backward beyond the knee was removed. Free bleeding was obtained from above, but not from below.

Following the operation there was definite improvement for about one week. The fever remained normal except on two occasions when there was a rise to 100°, but no chills. Severe pain in the head returned and he became listless at times. On one occasion he complained of temporary diplopia. The papilledema showed no improvement and neurological examination showed absence of left abdominal reflex and slight ptosis of the left eyelid. A tentative diagnosis of brain abscess, right temporosphenoidal lobe was made and exploration advised. On January 28th trephine and exploration of the right temporosphenoidal area failed to reveal any abscess. The patient failed rapidly and died about six hours following the operation. The autopsy findings were essentially negative except for a large thrombus filling completely the right lateral and sigmoid sinuses.

The interesting features in this case are:

First,—The early onset of the clinical signs of sepsis suggesting an early bacteremia and probably also an early thrombophlebitis of the right sigmoid sinus. The "head" or oldest segment of the thrombus was found in the jugular bulb. Primary thrombophlebitis of the jugular bulb is rare and probably occurs directly by extension of infection through the floor of the middle ear cavity.

Second,—The retrograde extension of the thrombophlebitis against the blood stream after *thrombectomy* and ligation of the internal jugular vein.

Third,—The early and persistent increase of intracranial pressure with marked papilledema and clinical signs suggesting brain abscess.

The second case was that of a woman 46 years of age who was brought to the hospital in an ambulance on March 13, 1936. Her illness had begun one month before with a severe "head cold" and a pain in her left ear which lasted about five days. There was no history of discharge. The earache subsided but she continued to complain of tenderness behind the left ear and in the left temporal region. For three weeks previous to admission she had had daily chills and fever, headache, nausea, and vomiting. There had been pain, tenderness and conspicuous swelling of the left side of the neck for the past ten days. Examination on March 16th, 1936, revealed tenderness and diffuse swelling of the left neck extending from the mastoid to the clavicle. The left ear drum was normal. X-ray of both mastoids showed second degree involvement of the left mastoid. Ophthalmoscopic examination showed bilateral papilledema of about four diopters with a few small retinal hemorrhages. Urinalysis showed a large quantity of sugar and acetone, with some diacetic acid. Blood sugar was 236 mgms. Blood culture was negative after 48 hours' growth. Spinal fluid was essentially negative except for markedly increased pressure. Tobey-Ayer test positive. White blood cells 14,000.

A diagnosis of masked subacute mastoiditis, left ear, with sinus thrombophlebitis was made, and operation advised.

On March 19th the left mastoid was opened. The cells were necrotic and filled with purulent exudate and granulations. Lateral sinus was exposed and found filled with a large thrombus extending from the torcula to the bulb of the jugular. A transverse incision down through the superficial layer of the deep cervical fascia revealed a large abscess of the neck with complete necrosis of the left jugular vein. Drainage was established and a slow but steady improvement occurred. The urine became sugar-free and blood sugar returned to normal one week following the operation. The papilledema gradually subsided and on April 17th, 1936, the corrected vision was 20/20 when the patient seemed fully recovered.

The interesting features of this case are:

First,—The development of an advanced mastoiditis without perforation of the tympanic membrane. There was tenderness over the mastoid, but no external swelling.

Second,—The massive thrombophlebitis beginning in the lateral sinus and extending with the blood stream to involve the entire jugular vein.

Third,—Complete recovery without complication.

Discussion

DR. C. N. SPRATT (Minneapolis): In my experience lateral sinus thrombosis has not been a serious complication in mastoiditis. In the thirty years in which I did ear work, twenty-one cases of sinus involvement or approximately 7 per cent of the mastoids operated on had this complication. There were four deaths in this series. Two of these were associated with meningitis and the other two were uncomplicated. This gives a death rate in the latter, of approximately 10 per cent. In both of these fatal cases the condition had been unrecognized and was of long duration and the jugular veins in each case were completely occluded. Of the twenty-one cases, the jugular vein was ligated in fifteen. There are certain errors of diagnosis if one relies upon the blood culture, as it is well known that cases of pneumonia, typhoid, endocarditis, etc., may give positive cultures where there is no lateral sinus thrombosis; and, on the other hand, many cases of lateral sinus thrombosis give negative blood cultures, as the thrombus may be a mural one and sterile.

DR. A. E. SMITH, (Minneapolis): There was considerable sclerosis of the mastoid cells in the first case. Was there a history of ear trouble there?

DR. CAMP: No, there was no history of previous abscess.

DR. A. R. COLVIN (St. Paul): We have at the Ancker Hospital at present a man whom I saw twenty-seven years ago with a condition due to sigmoid sinus thrombosis, which seems worth reporting as a discussion to Drs. Camp and Nordland's paper. When first seen by me, he was unconscious, with evidences of pyemia, *i. e.*, suppurating knee and shoulder joints, abscess of his chest wall. He had a malodorous discharge from his right ear and although tender over the mastoid process there was neither swelling nor redness of this region; there was tenderness along the course of the internal jugular vein. On opening the vein pus escaped and it was found that the pus was in a section of the vein walled off by endophlebitis at about the middle of its course. On opening the mastoid, pus escaped; and on opening the sinus pus also escaped. The knee and shoulder joints were drained of pus, as was the abscess in the chest wall. The patient recovered and is now in the hospital for other ailments.

The question of papilledema from venous obstruction due to sinus thrombosis was demonstrated in the case of a young woman who was suffering from severe headache and blindness, these dating back to a febrile illness of a year previously. She was operated upon by a colleague under the supposition that she had a brain tumor. At the operation, the bleeding from the bone was so profuse that death ensued. Autopsy revealed obliteration of all of the major dural sinuses, with here and there small pockets in the sinus at the entrance of the diploic veins. The thrombosis in this instance was due to infection not going on to suppuration; the blindness was evidently due to the long-continued venous obstruction.

The third case was a child of three years who was suffering from bilateral mastoid suppuration—neglected. The left mastoid cells were drained of pus and his condition improved. Shortly, however, it was necessary to drain the opposite mastoid. After this, however, his symptoms not improving, a diagnosis of sigmoid sinus phlebitis was made and of the right—last side operated. On opening this sinus, however, thrombosis was not found and it was necessary to pack it. Later he became suddenly unconscious and blind and finally a red streak appeared over the course of the internal jugular vein on the side of the first operation. The boy's condition was desperate but it was concluded that he had sinus and jugular vein thrombosis. On exposing the vein it was found to be adherent to its sheath, thus indicating at least a phlebitis. However, even if it were (because of the soft nature of the thrombus) impossible to say positively that the vein contained a thrombus, still all the other

indications pointed to this and on opening the vein a clot extending from above and dichotomously extending into the subclavian vein was removed. Because of the child's precarious condition at this time the sinus was not explored through the old operative wound. However, the boy recovered. All the facial veins became dilated. This was twenty-six years ago and he is still living.

I report these cases as demonstrating the variable kinds and results of sinus thrombosis.

The meeting adjourned.

R. T. LAVAKE, M. D.

Secretary.

NEWS ITEMS

Dr. James L. McCarthy, of Butte, Montana, died of a heart attack at his home in Butte on December 20, 1936. He was buried in Holy Cross cemetery in Butte on December 24.

Dr. F. E. Boyd, of Armour, South Dakota, has associated himself in practice with Dr. W. A. Delaney, of Mitchell, S. D.

Mitchell, South Dakota, has a new Medical Arts Building, at present housing 8 physicians and 4 dentists.

Dr. W. H. Gilsdorf, of New England, North Dakota, has enrolled in the special ophthalmology short course offered by the Minneapolis General Hospital. Dr. S. B. Seitz, of Minneapolis, will conduct Dr. Gilsdorf's practice in the interim.

Dr. Phillip Graham Reedy, 54, former major in the United States Army Medical Corps, and first white child born at Fort Totten, North Dakota, died on December 19 at Fargo, North Dakota. Death was accidental.

Dr. E. A. Hofer has purchased the practice and equipment of Dr. H. E. Jenkinson, of Wessington Springs, South Dakota, who recently retired because of ill health.

Dr. Edward Otis Church, 64, a graduate of the University of Illinois College of Medicine, Class of 1900, and a native of South Dakota since 1884, died at Watertown, South Dakota, on December 3, 1936.

Dr. R. T. Rohwer, of Mitchell, South Dakota, who has practiced internal medicine in that city for the past 7 years, has removed to Sioux City, Iowa, where he will join Dr. R. J. Harrington.

Dr. Alvirido W. Pearson, former University of Minnesota student, has accepted the position of resident physician in the Merced General Hospital in Merced, California.

Dr. Adolph M. Hanson, of Faribault, Minn., has been named an associate in research of the Philadelphia Institute for Medical Research. Dr. Hanson, who is known for his research work with the thymus and pineal glands, will continue to work and live in Faribault.

Officers and members of the Medical Association of Montana convened at Billings, Montana, on December

13, 1936, to discuss plans for the state convention of the Association to be held at Great Falls on July 12, 13, and 14, 1937.

The South Dakota Public Health Association held its annual meeting at Madison on January 24, in the Dudley-Stewart Hotel. This was a continuation meeting from October 20, 1936.

The Board of Regents of the South Dakota State University has petitioned the State Legislature to provide sufficient appropriations to bring the state medical school up to the standards laid down by the Council on Medical Education and Hospitals of the American Medical Association.

Dr. H. F. Hansen, of Vermillion, South Dakota, has been elected president of the Yankton District Medical Society of South Dakota.

Dr. Halvor Holte, 79, for many years a physician in Crookston, Minnesota, died on January 2, 1937, in Bethesda Hospital in Crookston.

Plans for a municipal hospital to cost about \$47,000 and to have a 26-bed capacity, have been completed by Park River, North Dakota, officials in consonance with the Federal Government.

Dr. J. C. Dunn, of Lewistown, Montana, has been appointed county health officer for a term of one year by the Fergus County commissioners. He has filled this office for several years.

Dr. Carl G. Swendseen, of Minneapolis, has been named chief of staff of the Swedish Hospital in Minneapolis succeeding Dr. Swan G. Wright.

Dr. Kenneth L. Bray, of Biwabik, Minnesota, a graduate of the University of Minnesota Medical School in 1934, is now associated with Doctors Hanson and Houston in Park Rapids, Minnesota.

Dr. L. F. Wasson, formerly of Battle Lake, Minnesota, has taken over the practice of the late Dr. A. O. Flom, at Chisago City, Minnesota.

Dr. G. E. Hertel, of Austin, Minnesota, has been elected president of the staff of St. Olaf's Hospital in Austin.

Dr. J. A. Roy, mayor of Red Lake Falls, Minnesota, has been elected a member of the Board of Trustees of the Minnesota Public Health Association.

Dr. Arthur M. Mulligan has inaugurated practice in medicine and surgery in the Iron Exchange Building at Brainerd, Minnesota.

Dr. George H. Olds, a graduate of the University of Minnesota Medical School, has become associated with Dr. B. J. Gallagher, of Waseca, Minnesota, in the First National Bank Building.

Dr. V. A. Mokler, of Wentworth, South Dakota, is the new president of the Third District Medical Society in South Dakota. Dr. George E. Whitson, of Madison, is vice president; Dr. Clarence E. Sherwood, of Madison, is secretary-treasurer; Dr. H. A. Miller, of Brookings,

is state convention delegate; and Dr. Myron Tank, of Brookings, is a new member of the board of censors.

Miss Carrie E. Haugen, 37, of Virginia, Minnesota, is the newly-chosen superintendent of the Staples Municipal Hospital, Staples, Minnesota.

Dr. Charles N. Spratt addressed the King County Medical Society at Seattle, Washington on January 18th. During his stay there, he showed his motion pictures on Eye Operations before the Puget Sound Academy of Ophthalmology.

The Extension Division of the University of Minnesota announces a lecture and demonstration course in X-ray diagnosis to be given by Dr. Leo G. Rigler and his associates at the University Hospital beginning Thursday, February 11 from 6:20 to 8:00 P. M. and continuing once each week for sixteen weeks. Anyone interested should communicate with the Extension Division, University of Minnesota.

Dr. B. S. Adams, of Hibbing, Minnesota has been elected president of the Range Medical Society. Dr. H. N. Sutherland, Ely, is the vice president; Dr. F. H. McFarland, Chisholm, is secretary; and Dr. J. Arnold Malmstrom and Dr. R. A. Salter, of Virginia, are members of the board of censors.

Dr. Evarts A. Graham, professor of surgery in Washington University School of Medicine at Saint Louis, Missouri, will deliver the annual Judd lecture in the chemistry auditorium of the University of Minnesota on "Accomplishments of Thoracic Surgery," Wednesday, Feb. 3. His address commences at 8:15 p. m.

Dr. R. M. Baker, of Sturgis, South Dakota, was elected president of the Black Hills Medical Society on December 17, 1936. Dr. P. P. Ewald, of Lead, was chosen vice president; Dr. R. A. Jernstrom, Rapid City, was elected secretary-treasurer; and Dr. Henry Davidson presented a paper, "Pneumonia."

Dr. M. J. Flom, of Zumbrota, Minn., was elected president of the Goodhue County Medical Society recently. Dr. R. B. Graves, Red Wing, is vice president; Dr. M. W. Smith, Red Wing, is delegate to the state medical association meeting; Dr. E. H. Juers, Red Wing, is secretary; and Doctors A. E. Johnson and A. W. Jones, of Red Wing, and M. W. Williams, of Cannon Falls, are members of the board of censors.

Dr. George Richards, Watertown, South Dakota, is the new president of the Watertown District Medical Society, succeeding Dr. M. C. Jorgenson. Dr. A. Einar Johnson, of Watertown, was re-elected secretary-treasurer. Dr. O. S. Randall, Watertown, is vice president; Dr. Jorgenson is delegate to the state medical convention, with Dr. G. B. Vaughn, Castlewood, as his alternate. Doctors H. W. Sherwood, Doland; and A. H. Christensen, Clark, are members of the board of censors.

Dr. J. A. Myers, Minneapolis, spoke on January 12 and 13, before the students and faculty of South Dakota State College at Brookings. On January 12, Dr. Myers also addressed the District Medical Society at

Brookings; and he also talked before the students of the Indian school at Flandrau, South Dakota; and the Brookings Rotary Club. On January 20, Dr. Myers presented a paper before the joint session of the Philadelphia Medical Society and the Pennsylvania Tuberculosis Association, in Philadelphia.

A beautiful new infirmary unit, part of a \$300,000 Public Works Administration project, has been added to the North Dakota State Tuberculosis Sanatorium at San Haven, of which Charles MacLachlan, M. D., is superintendent. The addition now brings the total capacity of the sanatorium to 431 patients. Occupation of the new unit must wait until the state legislature provides funds for the equipping and maintenance of the infirmary from the time of opening to the end of the current biennium (June 30, 1937). The new building itself will house 126 patients; and there are about 200 on the waiting list.

Two more cases of illegal medical practice were concluded in the last days of December, according to Julian F. DuBois, M. D., of St. Paul, Minn., secretary of the Minnesota State Board of Medical Examiners. Hilda Andrews, 30, a South Dakota woman practicing healing in Worthington, Minn., without a license, was sentenced to 60 days in jail by Judge Charles A. Flinn, of Worthington. Sentence was suspended after she returned to her home in South Dakota. The sentenced woman was using "The Brooking Methods of Ectyloitic Ablution", the equipment coming from one "Doctor" Brooking, of Sioux City, Iowa.

On December 21, Ethel Planque (*alias* Ethel Benson), 52, was sentenced by Judge Frank E. Reed, of Minneapolis, to from one to 15 years in the State Reformatory for Women at Shakopee, Minn. She pleaded guilty on December 19 to manslaughter after a 19 year old Minneapolis girl succumbed on December 4 to an abortion performed by the guilty woman.

At the close of the last academic year, Dr. E. P. Lyon, Dean of the Medical School, retired from active service at the University of Minnesota. During his administration, covering a period of twenty-three years, the Medical School exhibited steady and continued growth. As a fitting tribute to his stimulating leadership, the alumni and faculty of the Medical School proposed to establish in his honor the Elias Potter Lyon Medical Lectureship in Medicine at the University, the fund for this purpose to be raised through subscriptions by alumni, faculty, students, and friends. The response to this proposal has been enthusiastic and generous. Anyone who welcomes the opportunity of contributing to the Lyon Lectureship fund before the project is closed may send his donation to the Office of the Comptroller of the University of Minnesota.

Through the co-operation of Mr. C. A. Johnson, county attorney of Blue Earth County, the Minnesota State Board of Medical Examiners succeeded in banishing one Henry Jeffrey, an Indian quack, from the state for one year. Fined \$100.00 and a suspended sentence of 90 days in jail by Judge L. H. Morse, of Mankato, Jeffrey was warned absolutely to refrain from practicing

healing in Minnesota.

Julian F. DuBois, M.D., of St. Paul, Minn., secretary of the Minnesota State Board of Medical Examiners, advises THE JOURNAL-LANCET that the license of Frederick H. Moss, M.D., of New Richland, Minn., has been revoked because of his alleged habitual addiction to narcotics. Dr. Moss was graduated from the University of Minnesota Medical School in 1927. Dr. DuBois also reports that William M. Chowning, M.D., 63, of Minneapolis, has forfeited his license to practice medicine in Minnesota by order of the Board. Dr. Chowning was convicted of abortion on April 24, 1936, in the Hennepin County District Court.

MISCELLANEOUS

Grand Forks Adopts A Fracture Regulation

In an editorial published in THE JOURNAL-LANCET, January 1st, 1936 the Chicago Ambulance and Fracture Ordinance was printed. The editorial suggested that this ordinance should be shown to city officials with the hope that other cities might adopt a similar regulation for the protection of citizens who may receive fractures. Recently the Board of City Commissioners of Grand Forks, North Dakota has approved and adopted the following regulation:

PUBLIC HEALTH REGULATION NO. 525

The Board of Health judge it necessary for the public health and safety of inhabitants to prevent further damage to an injured person after an accident.

No person, firm or corporation shall operate or cause to be operated any ambulance, public or private, or any other vehicle commonly used for the transportation or conveyance of the sick or injured, without having such vehicle equipped with a set of simple first aid and splint appliances approved by the board of health and having in attendance at all times such vehicle is in use a person who has obtained a certificate of fitness as an ambulance attendant from the board of health.

Any person desiring a certificate as an ambulance attendant shall make application in writing therefore to the board of health. Before the issuance of any such certificate the applicant therefore must present evidence of his qualifications to fill such position and must demonstrate to the satisfaction of the board of health his ability to render emergency first aid and to apply approved splints to arm and leg fractures.

This regulation shall take effect and be in force from and after its approval by the Board of City Commissioners.

E. C. Haagenson, City Health Office.

Approved and Adopted Dec. 23, 1936,

Attest:

[SEAL]

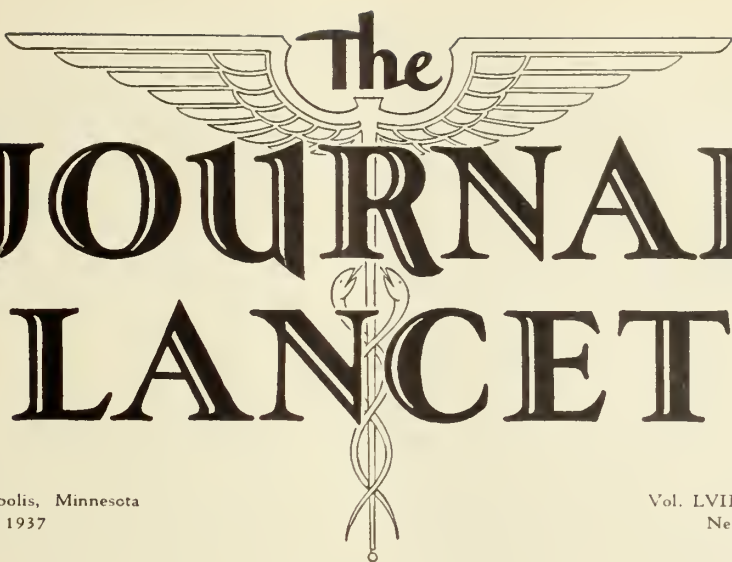
CHAS. J. EVANSON, City Auditor.

E. A. FLADLAND, President Board of City Commissioners, Grand Forks, North Dakota.

(Jan. 12, 1937)

This regulation like the Chicago Ordinance does not specify special splints which permit the application of traction during transportation such as the Thomas-Murray hinged ring splint for the arm or the Keller-Blake hinged half-ring splint for the thigh or leg, but the splints used must be of a type approved by the board of health and the ambulance attendants must understand their use. The board of health will undoubtedly only approve modern methods and splints. This regulation should be a protection to the citizens of Grand Forks and a model for adoption by other cities.

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New Series

Respiratory Allergy* *The Incidence of Other Associated Manifestations*

French K. Hansel, M. D., M. S.**
St. Louis, Mo.

AMONG the various manifestations of allergy, those which concern the upper and lower respiratory tracts (perennial nasal allergy, hay fever, asthma, and allergic bronchitis) are the most commonly encountered. Other common manifestations of allergy, such as urticaria, eczema, angioneurotic edema, gastrointestinal allergy and allergic headache are frequently associated with the respiratory symptoms. (Approximately 70 per cent in the past and present history; more than 50 per cent in the present history.)

One of the most important characteristics of the allergic individual therefore is the tendency to exhibit more than one manifestation of allergy. Certain manifestations of allergy, such as infantile colic, eczema, and urticaria may appear in early infancy, to be followed later by the nasal manifestations and asthma. Early manifestations may disappear and at some time later in life there may be a reappearance of the same or different manifestations. The patient may acquire asthma and the nasal manifestations of allergy in infancy and childhood, and they may persist throughout life. In general, there is a tendency for certain manifestations to shift from one type to another. It is always the predominating manifestation which characterizes the clinical picture and for which the patient seeks relief. The patient who has the nasal manifestations of allergy usually gives a history of having had other manifestations in the past which disappeared or he has other manifestations accompanying the nasal symptoms. Occasionally the nasal symptoms may become very mild when some other manifestation predominates the clinical picture.

*Prepared expressly for the special Allergy issue of THE JOURNAL-LANCET. From the Department of Otolaryngology, Washington University School of Medicine, Oscar Johnson Institute, and McMillan Hospital.

**Assistant Professor of Clinical Otolaryngology, Washington University.

In a group of cases of allergy in children reported by Peshkin¹, he found that other allergy was associated with the principal manifestations as follows: 22 per cent of the patients with asthma had eczema; 7 per cent had urticaria; and 2 per cent had angioneurotic edema. In children, eczema frequently begins in infancy and usually precedes the onset of asthma by one to seven years. In a group of 2,063 cases observed by Rackemann and Colmes², other allergy was reported as follows: with hay fever, 37 per cent, practically all of which were asthma; with asthma, 28 per cent, most of which were hay fever; with eczema in adults, 50 per cent; with eczema in children, 16 per cent; with urticaria, 15 per cent. The average percentage of other allergy in the entire group was 27 per cent. In children with eczema and in urticaria at all ages, Rackemann³ noted that the incidence of other allergy was lower. In 100 cases of gastrointestinal food allergy reported by Rowe, the incidence of other allergy was stated as follows: asthma, 13 per cent; hay fever, 20 per cent; skin manifestations, 32 per cent; and migraine, 36 per cent. In 83 cases of asthma caused by food allergy, reported by Rowe⁴, other allergy occurred as follows: hay fever, 17 per cent; skin manifestations, 40 per cent; migraine, 36 per cent; and abdominal allergy, 20 per cent. In 86 cases of migraine reported by Rowe⁵ as due to food allergy, the incidence of other manifestations was as follows: asthma, 12 per cent; hay fever, 17 per cent; skin manifestations, 43 per cent, and abdominal allergy, 64 per cent. In a group of 205 patients of all ages reported by Bray⁶, there was a history of other allergy in 42 per cent. Bray also reported that in 300 successive cases of asthma in children, 36 per cent gave a past or present history of eczema; 37 per cent of urticaria; 9 per cent of prurigo; 7 per cent of migraine; 5 per cent of hay fever; and 5 per cent of enuresis.

In 220 cases of nasal allergy in adults⁷, we found the incidence of other allergy as follows: gastrointestinal allergy, 55 per cent; headache, 43.6 per cent; hay fever, 27.7 per cent; urticaria, 26.8 per cent; asthma, 25.5 per cent; angioneurotic edema, 18.2 per cent; eczema, 12.3 per cent; and bronchitis, 10.9 per cent.

The occurrence of other allergy in the group of 220 patients with the nasal manifestations is shown in Tables I and II. In only 36, or 16.4 per cent, of 220 cases was there an absence of this history. The combined consideration of the family history and the history of the occurrence of other manifestations of allergy should indicate the immediate possibility of the individual being allergic in more than 90 per cent of the cases. The time of the occurrence and the incidence of the various other manifestations in relation to the nasal symptoms are tabulated in Table II. In 55, or 25 per cent, of the cases, one or more manifestations of other allergy occurred during infancy and childhood. In four cases it occurred early in life and did not reappear with the nasal symptoms. In 23 cases the patients had other allergy from early life, both preceding and accompanying the nasal manifestations. In many cases some types of allergy persisted throughout. In other instances, there was a shifting from one manifestation to another. In Table III these 55 cases are tabulated as to age, incidence in decades, and the age of onset of the nasal manifestations. Forty of the 55 patients were between the ages of 15 and 30 years, and in 32, or 58 per cent, the onset of the nasal symptoms occurred in infancy and childhood. In six, or 11 per cent, they appeared at puberty, and in 17, or 31 per cent, the nasal symptoms appeared after the age of puberty.

TABLE I

OCCURRENCE OF OTHER MANIFESTATIONS OF ALLERGY (ADULTS)

Early in life only.....	4
Early, preceding, and accompanying nasal allergy.....	23
Early and accompanying nasal allergy.....	28
Preceding nasal allergy only.....	6
Preceding and accompanying nasal allergy.....	57
Accompanying nasal allergy only.....	66
No other allergy at any time.....	36
Total	220

TABLE II

Incidence and Occurrence of Other Allergy—Past and Present (Adults)

	G. I.	Headache	Hayfever	Urt.	Asthma	Angio.	Eczema	Bron.	Total
Early	2	0	0	10	5	0	10	7	34
Early, pre. & accom.	2	0	0	1	1	0	2	0	6
Early and accom.	15	2	0	1	3	0	2	1	24
Preceding	2	7	1	12	6	4	6	2	40
Pre. & accom.	11	18	10	13	4	2	3	2	63
Accompanying	89	69	50	22	37	34	4	12	317
Total	121	96	61	59	56	40	27	24	484
% incidence in 220 cases	55.0	43.6	27.7	26.8	25.5	18.2	12.3	10.9	
Total accompanying	117	89	60	37	45	36	11	15	410
Total pre. which disappeared	4	7	1	22	11	4	16	9	

TABLE III

PATIENTS WITH OTHER MANIFESTATIONS OF ALLERGY IN INFANCY AND EARLY CHILDHOOD

Age of Patients	Number
15-20	20
21-30	20
31-40	9
41-50	5
51-60	1
	—
	55
Age of Onset	
0-2	9
2-10	23
10-15	6
16 or over.....	17
	—
	55

As shown in Table I, six patients had other manifestations which disappeared before the onset of the nasal and in 57 cases other allergy both preceded and accompanied the nasal. In 118, or 53.6 per cent, of the cases, therefore, other allergy preceded at various times the onset of the nasal. In 66 cases, or 30 per cent, other allergy only accompanied the nasal manifestations, but in 174, or 79.1 per cent, including that which had already been present and still remained, other allergy accompanied the nasal symptoms. As already mentioned, there is a tendency to shifting from one manifestation to another. Sometimes the nasal symptoms temporarily or permanently disappear while other manifestations predominate the clinical picture. The incidence and time of appearance of the various types of allergy in relation to the onset of the nasal symptoms are tabulated in Table II. In the past and present history, 484 different manifestations appeared in 220 cases, an average of 2.8 per patient. In order of their incidence, the various manifestations appeared as follows: gastrointestinal, 121; headache, 96; hay fever, 61; urticaria, 59; asthma, 56; angioneurotic edema, 40; eczema, 27; and bronchitis, 24. Of the total of 484 manifestations, 410, or slightly less than two per patient, remained and accompanied the nasal symptoms. Some patients showed as many as six different manifestations at various times in the past and present history. There is a tendency for certain types to

be associated. The incidence of other manifestations of allergy which accompanied the nasal symptoms was as follows: gastrointestinal, 117; headache, 89; hay fever, 60; asthma, 45; urticaria, 37; angioneurotic edema, 36; bronchitis, 15; and eczema, 11. Of the total of 484 manifestations, 410 remained and 74 disappeared. These manifestations disappeared, respectively, as follows: urticaria, 22; eczema, 16; asthma, 11; bronchitis, 9; headache, 7; gastrointestinal allergy, 4; angioneurotic edema, 4; and hay fever, 1.

In this group of 220 cases, 36 had no other allergy at any time. Twenty-three of the patients were male and 13 were female. It is difficult to explain the absence of other allergy in a larger percentage of the males. There was no difference between these cases and those with other allergy as to age incidence, or to the skin reactions.

In 200 cases of nasal allergy in children, the incidence of other allergy was as follows: asthma, 69.5 per cent; gastrointestinal allergy, 33.5 per cent; eczema, 32.5 per cent; headache, 10 per cent; urticaria, 23 per cent; hay fever, 22.5 per cent; angioneurotic edema, 6 per cent; bronchitis, 4 per cent.

In our group of 200 children with the nasal manifestations of allergy, we found an incidence of other allergy which was much higher than that reported by other observers. The higher incidence of asthma may be accounted for by the fact that it was considered as a separate manifestation. Perhaps nasal allergy should be considered as a part of the asthma because in all children with asthma the nasal manifestations always accompany it. In only nine of 200 children, as shown in Table IV, was there an absence of other allergy in the past or present history. In this group the manifestations considered as early were those which appeared in infancy, before the age of two years. In 85 of the 200 children, the onset of other allergy occurred in infancy. In nine instances other allergy which appeared in infancy disappeared and did not recur. In 22 instances other allergy appeared in infancy, persisted throughout and accompanied the nasal symptoms. In 53 instances other allergy appeared in infancy, disappeared and recurred again with the nasal symptoms. These were not always the same manifestations; for example, the eczema in infancy was often replaced by urticaria or some other manifestation. In ten instances other allergy preceded and accom-

panied the nasal manifestations. In 95 instances other allergy only accompanied the nasal symptoms. There were in all, therefore, a total of 85 instances of other allergy in infancy; a total of 34 preceding the nasal symptoms after infancy and 180 accompanying the nasal manifestations. The incidence and the time of appearance of the various other manifestations in relation to the nasal symptoms are shown in Table V. In the past and present history of 200 patients, the various manifestations appeared in 400 instances in the following order: asthma, 139; gastrointestinal, 67; eczema, 63; urticaria, 46; hay fever, 43; headache, 20; angioneurotic edema, 12; and bronchitis, 8. Of the total of 400 manifestations, 80 disappeared and 320 remained in the following order: asthma, 139; gastrointestinal, 45; hay fever, 45; urticaria, 30; eczema, 29; headache, 19; angioneurotic edema, 10; and bronchitis, 3. In order of their importance, various manifestations disappeared, as follows: eczema, 34; gastrointestinal, 22; urticaria, 16; bronchitis, 5; and headache, 2. There was no change in the asthma and hay fever occurrence. While there was a tendency for such manifestations as eczema, gastrointestinal symptoms, and urticaria to disappear, in general, however, there was a tendency for these manifestations to be replaced by others. The gastrointestinal diseases which occurred in early life were mostly of the nature of infantile colic, while the disturbances which accompanied the nasal symptoms were characterized by pain, nausea, vomiting, gas, and diarrhea. Of all the manifestations, eczema is the most frequent to subside, but it is often replaced by other manifestations.

TABLE IV

OCCURRENCE OF OTHER MANIFESTATIONS OF ALLERGY PAST AND PRESENT (CHILDREN)

Early only	9
Early and preceding only.....	1
Early, preceding and accompanying	22
Early and accompanying	53
Preceding only	1
Preceding and accompanying	10
Accompanying only	95
No other allergy at any time.....	9
Total	200

TABLE V

Incidence and Occurrence of Other Manifestations of Allergy Past and Present—(Children)

	Asthma	G. I.	Eczema	Urt.	Hay Fever	Headache	Angio.	Bron.	Total
Early	0	21	32	8	0	0	2	2	65
Early, preceding & accom.	0	0	19	0	0	0	0	0	19
Early and accompanying	0	10	4	5	0	0	0	0	19
Preceding	0	1	2	8	0	1	0	3	15
Preceding & accom.....	0	0	0	3	2	0	0	0	5
Accompanying	139	35	6	22	43	19	10	8	277
Total past and present.....	139	67	63	46	45	20	12	8	400
% incidence in 200 cases	69.5	33.5	32.5	23	22.5	10	6	4	
Total accompanying	139	45	29	30	45	19	10	3	320

The diagnosis and treatment of the nasal manifestations of allergy in adults and children are problems which, therefore, do not entirely concern the nose and paranasal sinuses, but other associated respiratory allergy such as hay fever and asthma as well. In addition to the respiratory manifestations as a whole, other associated allergy, such as the skin manifestations, gastrointestinal allergy, and allergic headache, is also frequently present.

Table VI shows the relative incidence of the various types of respiratory allergy and the percentage incidence of other allergy associated with them in the past and present history. Among the respiratory forms of allergy, it is noteworthy that approximately 27 per cent of the patients with nasal symptoms also have hay fever, and about 20 per cent have asthma. Taking the respiratory form as a group, about 75 per cent give a past or present history of other associated allergy, such as the skin, gastrointestinal, and headache types. Only about 25 per cent of the cases of respiratory allergy, therefore, do not have other associated allergy. It is noteworthy that in practically all of the patients with respiratory allergy, the associated allergy accompanied it. Only a few patients, therefore, gave a history of other allergy in the past history only.

TABLE VI
OTHER ALLERGY ASSOCIATED WITH NASAL
MANIFESTATIONS
ADULTS

	Total	No other allergy	Associated allergy
Nasal allergy	128 58.2%	36 28.1%	92 71.9%
Hay Fever	9 4.0	4 44.4	5 55.6
Nasal Allergy and hay fever	38 17.3	9 23.7	29 76.3
Nasal Allergy and asthma	32 14.5	6 19.0	26 81.0
Nasal Allergy, Hay fever and asthma	13 6.0	1 7.7	12 92.3
	220	56 25.6%	164 74.4%

CHILDREN

Nasal allergy	52 26.0%	10 19.2%	42 80.8%
Hay fever	4 2.0	2 50.0	2 50.0
Nasal allergy and Hay fever	5 2.5	2 40.0	3 60.0
Nasal allergy and Asthma	99 49.5	35 35.4	64 64.6
Nasal allergy, Hay fever and asthma	40 20.0	15 37.5	25 62.5
	200	64 32.0%	136 68.0%

Table VI also shows the various respiratory types and the percentage incidence of associated allergy in 200 children. It is noteworthy that only 30 per cent had nasal symptoms alone and that 70 per cent had nasal symptoms and asthma. The relative incidence of hay fever in the entire group was 25 per cent. Taking the group as a whole, 32 per cent had only respiratory allergy and 68 per cent had other allergy associated with it in the past and present history. In these children this associated allergy occurred in the present history in approximately

50 per cent, while in about 18 per cent the associated allergy occurred only in the past history. This past allergy manifested itself chiefly in infancy in the form of eczema, urticaria and gastrointestinal colic.

On the basis of these statistical data, it is evident that the nasal manifestations of allergy occur in the absence of any other allergy in only about 25 per cent to 32 per cent. In the remaining 68 to 75 per cent, therefore, hay fever, asthma, skin and gastrointestinal manifestations, and allergic headache complicate the clinical picture.

TABLE VII

SKIN REACTIONS TO ALLERGENS IN 220 ADULTS

Pollens	2
Inhalants	11
Foods	19
Pollens and foods	8
Inhalants and foods	103
Pollens, inhalants and foods	57
Negative	20

Total 220

SKIN REACTIONS TO ALLERGENS IN 165 CHILDREN

Pollens	7
Inhalants	20
Foods	14
Pollens and inhalants	18
Pollens and foods	7
Inhalants and foods	34
Pollens, inhalants and foods	25
Negative	40

Total 165

The positive skin reactions obtained in 220 adults with respiratory allergy are shown in Table VII. On the whole, the positive intracutaneous reactions obtained to pollens, other inhalants, and foods were quite comparable to the various types of respiratory allergy with their associated manifestations, as shown in Table VI. Sixty-seven patients showed positive reactions to pollens and 60 of these patients had hay fever of the tree, grass, or ragweed type. It is noteworthy that only two patients reacted to pollen alone. Eight also reacted to foods and 57 to inhalants and foods. A total of 171 patients reacted to inhalants other than pollen and 187 reacted to foods. About ten per cent of all patients gave negative skin reactions.

Among 165 children with respiratory allergy, positive reactions were obtained in 125, or approximately 75 per cent, by the scratch method. Fifty-seven patients showed reactions to pollens. Only 7 reacted to pollens alone. The remaining 50 also reacted to inhalants, to foods, or to inhalants and foods, as shown in Table VII. Among the 165 patients, 97 reacted to inhalants other than pollens and 80 reacted to foods. Clinical sensitivity to foods in children occurs in about 60 to 70 per cent or more of the cases. It is apparent, therefore, that skin tests by the scratch method with foods fail to show positive reactions in at least 50 per cent of those who are actually sensitive to foods.

Summary

These studies on the association of the various manifestations of allergy show the common occurrence of this condition in multiple rather than in single form. The patient usually presents himself for diagnosis and treatment for that manifestation which predominates the clinical picture. Associated manifestations of lesser importance, therefore, should not be overlooked. The patient with perennial nasal symptoms of allergy may have hay fever in the spring, summer, or fall. The hay fever symptoms may predominate the clinical picture while the nonseasonal symptoms may be mild or severe. If mild, attacks may be considered as acute rhinitis. Patients with perennial nasal symptoms may have asthma either with hay fever or only during the winter months. It is important to emphasize also that allergic bronchitis not infrequently accompanies nasal allergy during the winter months without any very definite evidence of true asthma. The nasal manifestations of allergy in children are frequently overlooked unless associated with asthma. The patient whose respiratory symptoms consist only of hay fever may have allergic headache or gastrointestinal allergy or some form of skin allergy at other times of the year. Gastrointestinal allergy or allergic headache may, on the other hand, appear as the predominating

symptom. Nasal symptoms may be associated in mild degree. The diagnosis of nasal allergy is always good presumptive evidence that these other manifestations are also of an allergic nature. Such manifestations as allergic headache, gastrointestinal allergy, and skin allergy are most frequently caused by hypersensitiveness to foods. The association of these manifestations with the respiratory types of allergy always suggests very strongly that foods also play an important part as etiologic factors. From these studies it is evident, therefore, that most allergic patients are affected with multiple manifestations all of which must be considered in the clinical picture from the standpoint of diagnosis as well as treatment.

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Asthma and Allergic Rhinitis from Molds*

An Analysis of Ninety Cases

Samuel M. Feinberg, M. D.**
Chicago

THE study of fungi has received comparatively little attention among medical bacteriologists and has found no great place in the curricula of medical schools. This attitude has been principally due to the fact that infectious diseases in man due to fungi, although of great importance, are of too infrequent occurrence to engage the sustained interest of the medical mind. The realization that fungi may produce disease in ways other than infection, that is, by the production of reactions of hypersensitiveness, has increased our interest in these organisms in recent years.

For a long time allergic manifestations have been known to occur as a result of infection with certain fungi, particularly trichophyton and monilia. Our discussion here, however, will not take up this phase of the subject. The thesis of the present communication deals with the observation that there are large numbers of instances of respiratory allergy, consisting of either vasomotor rhinitis, cough or asthma, or combinations of

these, due to allergic reactions from the inhaled spores of non-pathogenic fungi constantly present in the general atmosphere. A number of reports concerning mold allergy have appeared in the literature. Since these papers have been reviewed in our earlier publications^{1, 2, 3, 4} no attempts will be made to refer to them here.

Many of our colleagues present resistance in accepting the above contention, probably because they do not realize the ubiquity of fungus spores in the air and because, having been taught so little about fungi in the medical school, they think only in terms of infection-producing organisms. It is our contention that it is neither illogical nor unreasonable to suspect fungi as causes of hay fever and asthma. Let us look at the evidence.

1. For over two years we have been exposing culture plates and microscope slides to the outdoor air¹. Our results show that there are numerous spores of molds in the air, on many occasions exceeding the pollen counts at the height of the season of the latter. The spores are to be found at all times of the year in varying numbers and varieties.

*This paper is the fifth of a series entitled "Studies on the Relation of Microorganisms to Allergy." From the Allergy Clinic, Department of Medicine, and the Department of Bacteriology, Northwestern University Medical School.

**Assistant Professor of Medicine, Northwestern University Medical School; Attending Physician, Cook County Hospital.

2. Spores are the reproductive elements—the seeds—of molds. In general we have been impressed with the allergy-producing potency of the reproductive parts of plants and animals, such as nuts, egg, pollen, cottonseed, poppyseed, peas and beans.

3. Their light weight and small size enables these spores to be come widespread, and to easily reach our respiratory mucosa. The general resistance of molds and spores to temperature and other weather changes insures an air contamination practically all times of the year. These fungi originate from growing and dead vegetation and from the soil.

An analysis of 90 consecutive cases of hay fever and asthma due to fungi is presented here. These are all private patients, and although more instances of mold allergy were available we have chosen for this report only those from more recent files. This group does not include a large number of patients who were sensitive to yeasts² but not to other fungi. Neither does it include several instances of eczema in which the inhaled spores of non-pathogenic fungi appeared to be the cause, nor instances of urticaria or hyperesthetic rhinitis due to the absorption from trichophyton infection.

Several clinical observations are of interest in this group. The age of these patients shows a preponderance among children, even more striking than among other types of allergy. The following are the findings:

TABLE I

Age in Years	Number of Patients
1-10	43
11-20	22
21-30	16
31-40	5
41-50	2
51-60	1
61-70	1

More striking still are the ages at which the symptoms first began:

TABLE II

Age at Onset of Symptoms	Number of Patients
1-10	70
11-20	11
21-30	7
31-40	0
41-50	0
51-60	1
61-70	1

Of the 90 patients, 52 were males and 38 females. In 26, vasomotor rhinitis was the only complaint. Only 9 had asthma as the sole complaint, while 55 had both nasal and asthmatic symptoms. The question of associated allergy is worthy of note. Mold allergy alone was present in 25. Only 7 patients had an associated allergy other than pollen, while 58 patients had definite pollen allergy.

The time of year in which the symptoms occurred varied in different patients, but in general could be divided into three groups. One group, comprising only a small minority, had their symptoms the year round. A second group, consisting of a larger number, had their symptoms practically confined to the summer months, but close inquiry showed a discrepancy between the pollen season and the season of their symp-

toms. The third group, and by far the largest, is composed of those whose symptoms occur either mostly during the summer, with slight attacks during the winter months or occur perennially with a tendency to aggravation in the summer. The great tendency for summer symptoms in those who have mold allergy is accounted by the decidedly greater contamination of the air with fungus spores during that time.³

Diagnosis

How are these patients to be diagnosed? In the first place, the history is important. Decidedly suspicious is a history of hay fever or asthma occurring in the summer or aggravated then in a patient who does not react to pollen or whose season of symptoms does not agree with the particular pollen to which he reacts. Attacks occurring more on warm, windy days (not explained by pollen in the individual instance), in musty rooms, in a damp basement, or in a hayloft are suspicious facts.

The diagnostic tests are, of course, important. Scratch tests are made usually with the killed powdered dry pellicle of the mold.⁴ Potent liquid extracts may also be used. The reactions are of the immediate type as seen with pollen and similar allergy. They have the usual characteristics of wheal, erythema and itching, and need no other interpretation than that used in ordinary allergic tests. Some delayed reactions have also been seen, but these will not be discussed here. In questionable cases the intradermal test may be used. If the scratch test has been negative, intradermal tests with the 1:1,000 extracts may be made.

The next question that arises is—which molds should be used in testing? There are thousands of species of molds in the air and the problem in different communities no doubt differs to some extent. What we are proposing here is, of course, not the final answer to the diagnosis of mold allergy in all parts of the country nor even in the middle west. As others become interested in this phase of allergy a great deal of new data will be added. In the meanwhile, however, we suggest that on the basis of our experience as to frequency of air contamination and frequency of reaction the following molds would constitute a practical list for the average worker:

Alternaria	Mucor
Aspergillus	Penicillium
Chaetomium	Fusaria
Hormodendrum	Trichoderma
Monilia sitophila	Trichophyton
Monilia albicans	Yeast

Mold extracts, in order to be potent and productive of good reactions, must be carefully prepared from the species producing many spores and carefully cultured to obtain the maximum number of spores. Failure to observe these and other details in the preparation of mold extracts has resulted in the past in some commercial specimens giving few or weak reactions. This has accounted for a good deal of the failures and skepticism in the past with respect to the frequent existence of mold allergy.

Treatment

With respect to the need for active treatment mold allergy can be compared to pollen allergy. As a matter of fact the necessity for treatment in the mold cases is even more definite than in the pollen cases. In the latter a change of locality may produce relief. Mold-sensitive individuals will probably have greater difficulty in avoiding the cause of their trouble.

The principles of desensitization with mold extracts differ in no way from those of pollen desensitization. Beginning with small doses, usually with 0.1 cc. of a 1:10,000 or a 1:100,000 extract, increases are made to approximately 1.0 cc. and then changed to stronger concentrations. In most instances the final dose in our patients has been about 1.0 cc. of a 1:100 extract. Several mold extracts may be combined. Systemic or local reactions occur and the same precautions must be used as in other types of desensitization. If possible, it is best to begin treatment during the winter, but treatment may be begun at any time, as soon as the diagnosis is made.

The types of molds to be used in treatment depend on the reactions of the individual, the concentration of the particular types of spores in the air and the particular or special exposures of the patient. The most common fungus that is employed in our therapeutic work is *alternaria*. *Aspergillus*, *penicillium*, *hormodendrum*, *monilia* and *mucor* extracts are also frequently used.

The results of desensitization treatment in 60 of these patients are presented. This group includes the 28 treated patients who were reported in an earlier paper.³ A large number of the patients treated with mold extracts also received other desensitization treatment, particularly pollen. In reporting the results here it is to be emphasized that: (1) Only those patients are included in whom molds were definitely established as a sole or additional cause of their symptoms. (2) In spite of the fact that other desensitization treatment was frequently employed, the effects of the mold desensitization, as followed by daily air analysis, is here evaluated. The results were as follows:

- 25 patients had 90 to 100 per cent relief.
- 23 patients had 75 per cent relief.
- 9 patients had 50 per cent relief.
- 3 patients had little or no relief.

Some of the seasonal cases have now been treated for two or more seasons and the results of the second season usually are better than that of the first. A fair proportion of the patients cited here have been previously treated by others, and a few by myself, with other types of treatment, particularly pollen, with either partial or complete failure.

The histories of two or three representative patients will serve to illustrate some of the salient points in connection with this group:

Case 1. Mrs. M. E. L., 61 years of age, was seen in consultation at the hospital in September, 1935. The history was that she had had chronic asthma for four years, had had complete examinations, including blood

chemistry, gastric and fecal analysis, chest and gastrointestinal X-rays, with negative results. She had been completely tested with allergens by four different but all competent men, three of whom were allergists. All tests had been negative. She was using several hypodermics of adrenalin daily. She had had various forms of treatment, including vaccine therapy, with no results. Her asthma had been present the year round, but had been somewhat worse in the summer. The remainder of the history was irrelevant.

Because of her age at the onset of the asthma the first impression gained was that we were dealing probably with an infectious asthma. But because of previous experience with occasional individuals who develop allergy at an advanced age it was decided to regard this patient as allergic until proved otherwise. No attempt was made to repeat the tests performed by our predecessors. Suspecting that probably the only tests not made were those with fungi, we made tests with the latter only. Much to our surprise a number of very strongly positive reactions were obtained by scratch tests.

For desensitization the molds which were regarded as the most likely to be incriminated were selected and combined in a treatment mixture. These included *alternaria*, *aspergillus*, *penicillium*, *chaetomium* and *mucor*. Treatment was begun on September 9, 1935, with 0.05 cc. of a 1:100,000 extract. This was continued throughout the year. On one occasion she had a systemic reaction following an injection. Freedom from asthma has been practically complete after the first two months of treatment.

Case 2. J. B., a 21-year-old medical student, was seen on July 27, 1929, giving a history of asthma and vasomotor rhinitis since infancy. Although his symptoms occurred chiefly in summer, he also had lesser symptoms the rest of the year. At the age of six he had a tonsillectomy-adenoidectomy. He had pneumonia and diphtheria as an infant. A history of allergy in the family was definite. Tests showed moderate reactions to the following: cat hair, dog hair, cattle hair, rabbit hair, feathers and two or three foods. There was a very strong reaction to yeast. The grass and ragweed pollen reactions were questionable. The foods, including yeast, were eliminated from the diet, and the epidermals avoided as much as possible.

Off and on from the fall of 1929 to the spring of 1933 the patient was treated with pollen and with house dust extract. The winter symptoms were improved but each summer from 1929 to 1933 inclusive he was observed to experience a marked aggravation of his symptoms beginning in July and continuing until late fall. From the spring of 1933 until the spring of 1935 he had no treatment and his symptoms recurred as they had previously. In the spring of 1935, during the process of reviewing some old records, the findings recited above impressed us as suspicious of mold allergy. The particular points which were regarded as suggestive, as had also been found in other patients of this type, were the seasonal tendency (especially between pollen seasons)

and the presence of allergy to yeast. The patient was requested to return, and tests with both pollen and fungi were made at this time. The pollen tests were again border-line or negative. Reactions to fungi, however, were many and marked. By scratch tests some of the wheals exceeded an inch in diameter.

Several of the fungi were selected for treatment. That summer he experienced some relief, although considerable symptoms were still present. In the spring of 1936 treatment was again started, adding two other varieties of fungi to the mixture. The results this year were decidedly improved over the preceding year. It was definitely certain that the treatment with mold extracts had a specific desensitizing effect.

Case 3. Herbert G., aged 22, of El Paso, Texas, presented himself on May 25, 1934, complaining of asthma of 15 years' duration. He had had tests for allergy in 1926 with the finding of some food reactors. A year in the mountains of New Mexico had temporarily improved his asthma. A nasal septum was operated upon in 1923 and nasal polyps were removed later. The father and maternal grandfather have asthma. A younger brother has hay fever due to Bermuda grass, and a sister has asthma from horses.

Examinations showed the usual findings of asthma and vasomotor rhinitis. Skin tests showed a slight reaction to mushroom and very marked reactions to several fungi and yeast. Treatment was instituted with an

extract of yeast and alternaria and was carried on for about a year. The improvement was rapid and marked and recent examination indicates that the patient has remained practically symptom-free.

Summary

Air-borne spores of fungi constitute an important group of causes of allergy of the respiratory tract—asthma and hay fever. There is a decided tendency toward seasonal aggravation in this type of allergy. A series of 90 cases of mold hypersensitiveness are analyzed, of which 60 have been treated with the specific fungus extracts with satisfactory results in most of them. Mold allergy is not a rarity but is a common entity, and in our experience in this part of the country it ranks next to pollen as a cause of inhalant allergy. With proper study as to the type and variety causing the patient's symptoms and a proper survey of his own community there is no reason why any physician cannot manage this group as well as he has learned to manage the pollen cases.

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Asthma*

A Syndrome, Not A Clinical Entity

Robert W. Lamson, Ph. D., M. D.**

Los Angeles, Calif.

TWO OPPOSING concepts relative to asthma deserve study. The first is that all patients presenting the classical signs and symptoms have a similar etiology, often erroneously referred to as allergic asthma; the second, that there are many causes for paroxysms of dyspnea and wheezing. The former would make no fundamental distinction between the asthma in one who had been a "hard rock" miner for many years and in the infant who manifests similar signs upon his first ingestion of egg. The latter concept, however, would admit that there are many conditions, basically quite different from each other, which may initiate an identical syndrome. Even normal man, by forced expiration, may duplicate some of these signs. Often one hears this criticism of a colleague, "He shows little interest in the patient after he has made the diagnosis." At the other end of the scale stands the polytherapist who employs numerous therapeutic agents for each sign and

symptom, with little regard for the causative factor. Between these two extremes lies the optimum pathway. If one extreme or the other is unavoidable, I would direct your attention toward the first, for reasons to be explained.

There are certain well established criteria of allergic asthma which are too often ignored; especially by those who make no distinction between the types of paroxysmal dyspnea. A brief discussion of these diagnostic landmarks will furnish a basis for subsequent considerations. Allergic asthma may appear early in life, often as croup, and frequently follows or may be associated with, eczema or nasal symptoms. It tends to recur, alternating with remissions—occasionally of years' duration. As previously indicated, the history discloses that one or more allergic conditions, hay fever, eczema, hives and possibly migraine, have been experienced by the patient. In one, a resistant eczema may miraculously clear up when "asthma" recurs; in another patient, the two conditions always coexist. What physician does not know a number of patients who "catch cold" before each at-

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**Professor of Preventive Medicine and Public Health, University of Southern California.

tack of asthma? Many of these "colds" are manifestations of a vasomotor rhinitis, not infrequently on a pollen basis, and if they were less atypical they would be designated as hay fever. Although the lungs are the reacting organs in all types of asthma, it is difficult to believe that the response is limited to this tissue. In the allergic individual, a specific cause may be demonstrated by clinical or laboratory tests; although one is seldom able to support all the assumptions made by the patient. Removal of the incriminated substances from the patient's environment may completely control the attacks. If this procedure is impossible, desensitization treatment may be equally successful.

I shall give little consideration to the physical findings during an attack. These are only occasionally pathognomonic, and were this not true the differential diagnosis would offer no problem.

In the interval between attacks, the victim of allergic asthma may be normal by physical and other examinations. In asthma of other types residual findings may be incorrectly interpreted as sequelae of allergic asthma. For example, examination of one known to have recurrent paroxysmal dyspnea may reveal the signs of pulmonary tuberculosis. To some, this is sufficient basis for the contention that asthma "runs into tuberculosis." Careful study of the history may disclose that the patient was tuberculous many years before the first attack of asthma. The latter is then but the result of the tuberculous process. This relationship might be summarized by the following: Many patients with pulmonary tuberculosis develop the asthmatic syndrome. Patients who have had considerable asthma are no more likely than normal to subsequently develop pulmonary tuberculosis. It must be added that the latter diagnosis is often suspected, but rarely confirmed—even at postmortem. Other sequelae, notably bronchiectasis, have been diagnosed antemortem, but are not often confirmed at necropsy.

No physical type of individual and no particular race, seems resistant to allergic asthma nor to any other type of paroxysmal dyspnea. The older concept, that asthma is a neurosis, undoubtedly arose from a misinterpretation as to cause and effect.

Routine laboratory examinations, such as blood serology, blood counts, sputum and urine tests, yield little that is pathognomonic of allergic asthma, but they may furnish important clues to other types of paroxysmal dyspnea. I hasten to add that I am aware of the emphasis given by some to the eosinophiles in blood and sputum.

The roentgenographic study is another examination, the significance of which is controversial. In spite of this, there is surprisingly little pertinent data in the literature. At my solicitation, Dr. Carter* has undertaken a study of the X-ray films of 500 patients with paroxysmal dyspnea. We have separated these patients into decades according to the age when the last film was taken. Within that particular decade they were further

subdivided on the basis of duration of dyspnea. To give the maximum significance to this factor, we consider the duration to represent the total lapsed time from the first attack to the date of the most recent film. During such a period certain of the patients may have had symptoms for but a few hours, but any pathologic process might have continued without the patient's knowledge. The films of more than 400 patients have been reviewed, but the study is far from completed. We have, however, noted certain trends which may not necessarily represent Dr. Carter's final conclusions. It appears that years of paroxysmal dyspnea may leave few, if any, signs detectable by X-ray, nor does it seem to make much difference at what age of life it occurred. There is a tendency to a low diaphragm with relative sparseness of pulmonary detail and a rather small and less tortuous aorta than normal for the age group—those past 50 years of age. The patients showing marked abnormalities belong in that group where the pathology antedates the first attack of paroxysmal dyspnea. It is imperative, therefore, that some roentgenologic examination be done on all patients with "asthma." Essentially negative findings are expected in the allergic group, but it is invaluable in disclosing the cause for other types of paroxysmal dyspnea.

Until recently there was general acceptance of the theory that heredity played an important part in allergic asthma. There was, however, considerable difference of opinion as to the percentage of patients who had a positive family history of one or more allergic conditions. One group was too ready to accept the patient's statement relative to these conditions in his ancestors, and probably also to accept migraine or any severe sick headache as a progenitor of asthma in the patient. Other observers do not accept the unqualified statement of the patient and are inclined to minimize a history of "asthma" during the last few weeks of life of the 85-year-old grandparent. It seems that a bilateral positive family history predisposes to an earlier onset and to a greater percentage of such offspring developing allergic conditions than does a unilateral allergic history. In each instance the vast majority of the true allergic patients developed the condition before the age of 40 or 45 years. A negative family history is not pathognomonic of non-allergic asthma, nor does it exclude the allergic type.

One may justifiably ask, "Will not the pathology settle the question?" If it could do so the answer would be a little late to be of greatest value to the particular patient. Longevity is supposed to be a characteristic of allergic asthma: in fact, many patients dread the protracted nature of the condition and would welcome an early demise. We find, however, in insurance statistics, statements to the effect that asthmatic patients tend to have an expectancy of but a few years if they are having asthmatic symptoms on or about the time of insurance examination. There are approximately 50 case reports, with necropsy findings, in the literature of the world covering a period of approximately 50 years. I have analyzed these raw data where the age of onset and

*Dr. Ray Carter, Roentgenologist, Los Angeles County General Hospital.

duration could be determined. It was found that 12 per cent had had paroxysmal dyspnea no more than one year, and a total of 44 per cent died within four years after onset. In a much larger series (137 patients), now in press, Dr. Butt and myself found that 17 per cent and 38 per cent respectively had dyspnea only for the short period indicated above. If the need for differential diagnosis was not evident before, it should be after considering these raw data. We hope to report in some detail the pathology in 48 patients of this series. These results may be summarized as follows: No single, or even several, factors confirm a diagnosis of allergic asthma, and in many instances the pathology was less typical in proven allergic asthma than in certain patients quite definitely of the nonallergic type. Here also the sequelae of the former group, in other organs, are not outstanding. Primary pathology in the circulatory system not infrequently induces asthma. In our series with necropsies we determined the cause of dyspnea to be: cardiovascular in 31 per cent, distortion of thorax and tracheal obstruction in 5 per cent, pneumoconiosis 10 per cent, pulmonary tuberculosis 5 per cent *etc.* There was a residuum of 24 per cent in whom we could not exclude the diagnosis of allergic asthma. Were the data more complete, I am confident that some of these would be excluded from this group.

Those who have previously reviewed the published case reports, as well as ourselves, admit that no more than 30 per cent of these represent asthma in the strict sense. There is, however, little unity of opinion as to which cases shall be thus classified.

It is commonly believed that a therapeutic test with epinephrine or other drug will distinguish between the types of paroxysmal dyspnea. This has failed in all but the rare instance. In fact, epinephrine may give more relief in one with typical cardiac dyspnea than in an equally typical allergic patient. It appears that hyper-reactivity to ordinary doses of one or more drugs may be expected in those who have had any type of paroxysmal dyspnea.

The literature concerning asthma, and my own experience, furnish ample support for the following contention. Asthmatic symptoms may be initiated on a cardiovascular, on a pulmonary and on a mechanical as well as an allergic basis. The symptoms and signs are so nearly identical that the diagnosis of allergic asthma may be made not once but often several times on each patient regardless of the primary factors.

The practical features of this problem are not alone academic ones; although it is of some satisfaction to know what condition one is treating. Of equal importance to the allergist should be an interest in eliminating some of the abuses of allergic testing. A case in point was a 51-year-old male diagnosed asthma by five different physicians in a period of six years. He had twice been subjected to allergic tests, and on one occasion was told he was sensitive to 12 foods. Epinephrine had been used to control severe dyspnea. No roentgenologic examination had been done: it is too frequently considered

unnecessary in "typical asthma." Being rather methodical, I placed him in front of a fluoroscope and discovered a large round pulsating mass in the region of the arch of the aorta. Blood serology confirmed the diagnosis, and he was referred to a colleague for treatment of the luetic condition. The "asthma" improved markedly and he lived an additional five years before the aneurysm ruptured. Within a month after first seeing that individual, I was called in consultation on an identical "asthmatic patient," one who was also relieved by epinephrine. In arteriosclerotic heart disease with hypertension, before the patient has developed other signs of a circulatory dysfunction, one may have attacks of "asthma." Such individuals are too frequently subjected to allergic tests, and too much is likely to be read into some of the tests. When such findings fail to solve the problem it is no wonder that allergic tests are condemned. If I correctly understand the pathology it is unlikely that the sputum or other excretion contains a specific asthmagenic organism. Since someone has to pay for allergic tests, for autogenous vaccines and for all refinements in diagnosis and treatment, they should be carried out only when indicated. It may seem too elementary to repeat the time-worn phrase "a careful history, and the knowledge of how to use the facts thus obtained, is the most valuable aid in diagnosis." No one can deny that, first, some cases cannot be classified, and second, that the percentage of correct diagnoses among those with paroxysmal dyspnea should be materially improved. A step in the latter direction might be to employ the term paroxysmal dyspnea instead of "asthma," and then qualify it to indicate the etiologic or other type. These concepts are not new and they find adequate support in practically all standard texts, not only those in the field of allergy but in those relating to diseases of the chest and to general medicine.

Summary

1. The term "asthma" as now employed has no more significance than the terms fever, cough or headache. Paroxysmal dyspnea is more suggestive of the characteristic signs and commits one to no particular etiology.

2. A great variety of circulatory dysfunctions—arteriosclerosis, hypertension, luetic aortitis with or without aneurysm, pulmonary sclerosis, *etc.*,—may indicate the asthma syndrome. Numerous authors emphasize the significance of an aortic reflex in the production of bronchial spasm in such conditions.

3. An equally large number of pulmonary conditions—tumor masses in the chest; distortion of the thorax and its contained structures as in Pott's disease; fibrosis as in pneumoconiosis, pulmonary tuberculosis and chronic bronchitis; and hypertrophic emphysema may cause attacks of asthma not readily distinguished from those occurring on a cardiovascular basis.

4. Allergic asthma seems to stand somewhat apart; although the symptoms during the attack are similar to, if not indistinguishable from those in the preceding groups. Sequelae, such as diseases of the heart and diseases of the lungs, are not common in this type of

paroxysmal dyspnea—life insurance statistics notwithstanding. The duration of the condition is notably long. Statistics to the contrary are usually based on incorrect evaluation of cause and effect.

5. In allergic asthma, physical, laboratory and roentgenologic findings tend to be essentially normal between attacks for the age group concerned. These diagnostic aids are invaluable in disclosing etiologic factors in other types of paroxysmal dyspnea. The most valuable single aid, not excepting allergic tests, is the history. The age when "asthma" first began and the presence or absence of other definitely allergic conditions, the sequence in which diseases of the heart or of the lungs and asthma appeared, are significant points in diagnosis. No rule should be inflexible, but the age 45 tends to be the upper limit for the onset of allergic asthma.

6. Differential diagnosis of these conditions has more than academic interest. It should prevent the misuse of allergic tests, save the patient or someone, considerable time, expense and inconvenience. Prognosis on any other basis is apt to be erroneous. The entire routine of treatment may and should be modified in keeping with the etiologic factors. Large doses of opiates might be well tolerated by one group and be contraindicated in the allergic type. It might be well to exclude aneurysm before using large doses of epinephrine or too drastic physiotherapy. Preventive measures and regulation of the patient's life also should be modified according to the primary condition. There is a good bit of evidence that many of those in the circulatory group do not survive more than five years after onset of paroxysmal dyspnea.

Serum Allergy*

Louis Tuft, M. D.

Philadelphia, Pa.

THE TERM, *serum allergy*, is employed to designate a condition of hypersensitiveness or altered reactivity existing in relation to foreign serum when the latter is brought into contact with human tissue cells. Individuals possessing this type of sensitiveness or allergy are likely to develop reactions of variable severity upon the injection of foreign serum. When such reactions do occur, they are known as *serum reactions*. Their occurrence first gained clinical recognition after the introduction of diphtheria antitoxin into clinical use in 1890. Since then and especially in the past 15 or 20 years, they have appeared with increasing frequency. The cause of the reaction was attributed at first to the antitoxin portion of the serum. However, it soon became evident that this could not be the cause, since similar reactions could be produced by the administration of normal horse serum. The remarkable therapeutic effects of diphtheria antitoxin stimulated the use of many other serums in clinical medicine and accounts in part for the increased incidence of serum reactions. Because of the frequency with which these serums are being employed, it seemed worth while to present to the practitioner some of the more pertinent facts relating to serum allergy in the hope that they might aid either in preventing serum reactions entirely or in lessening their severity. Because of its almost universal employment in the preparation of various types of immune serum, the antigen which is almost always responsible for serum allergy is horse serum; hence, any reference to the term *serum*, unless otherwise specified, should be interpreted as indicating horse serum.

The most common type of reaction occurring after the introduction of foreign serum into an individual who

has not been previously sensitized, is a *delayed type*, occurring as a rule six to ten days after the injection and never endangering the life of the patient. This type of reaction is known as *serum disease* or *serum sickness*. Its most characteristic symptoms in order of their usual appearance are: fever, an urticarial type of skin eruption, enlargement of the lymphatic glands and polyarthritides. These symptoms last four to six days on an average and disappear, leaving no trace of their presence.

This type of serum reaction is practically a normal phenomenon. If sufficient serum is employed and the administration is by the intravenous route, it can be induced in nearly every human being. For this reason, the incidence and severity of the reactions which occur after serum injection is extremely variable and dependent upon the character of the serum employed, the amount given and the route of administration. Thus, raw unconcentrated serums provoke a greater number and severer type of serum reaction than highly concentrated preparations like diphtheria or tetanus antitoxin in which an effort is made during the process of concentration to separate out the antibody-containing globulin fraction and to remove as much as possible of those extraneous proteins which are likely to cause reactions. The type of bacteria used for the production of the immune serum also seems to influence the incidence and severity of reactions. Thus, antistreptococcal or antipneumococcal serums are more serious offenders in this respect than are serums prepared against diphtheria or tetanus toxins. This difference does not seem to depend entirely upon our inability to concentrate the former serums as well as the latter. The nature of the organism itself seems to determine to some extent the degree of serum sickness which its antiserum provokes.

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The amount of serum injected and the route of administration are likewise important factors controlling the incidence and the character of serum reactions. Thus, the larger the amount of serum injected, the more likely is it to cause reaction; likewise, reactions are more prone to occur after intravenous injection than from any other route of administration.

Except for the discomfort to the patient, delayed serum reactions usually are entirely innocuous. They seldom occasion difficulty either in diagnosis or treatment. The history of serum injection and the characteristic symptoms and signs occurring after a definite incubation period of at least six days serve adequately as criteria for diagnostic differentiation.

Treatment is entirely symptomatic. The repeated use of small doses of adrenalin by injection may be valuable to relieve intense itching, in addition to antipruritic lotions applied locally. The internal administration of ephedrine may be of similar value. Salicylates are helpful in patients with marked joint pains. Attempts to prevent the onset of a delayed serum reaction are seldom of value. Ephedrine, adrenalin and calcium are the drugs most widely used but there is little evidence to indicate that these drugs are of prophylactic value. Purification and concentration of immune serums have accomplished more toward reducing the severity of the symptoms than any other measures.

Just why this type of serum reaction occurs is still an unsolved mystery. The appearance of circulating antibodies, especially precipitins and anaphylactic antibodies, coincident with or shortly after the appearance of symptoms suggested to Von Pirquet and Schick that the serum reaction was the result of interaction between the injected antigen (horse serum) and the antibodies which they stimulated. Further experimental investigation has cast doubt upon this theory, since Tuft and Ramsdell have shown that the serum sickness which follows the injection of normal horse serum is not associated with appreciable amounts of circulating antibodies and yet may be just as severe in intensity. It is very likely that this reaction does represent an attempt on the part of the body to rid itself of the injected antigen. Whether this is attended by an antigen-antibody reaction responsible for the symptoms of serum sickness awaits experimental demonstration.

As previously mentioned, the delayed type of serum reaction disappears in a few days and leaves no obvious trace of its presence. In a certain proportion of these patients, it is possible to demonstrate positive skin reactions to horse serum after the disappearance of the symptoms of the serum reaction. These skin reactions vary in degree and may persist for months or years afterward. They constitute evidence of what may be designated as *acquired or induced serum hypersensitivity or allergy*. This sensitiveness may be confined only to the skin or it may likewise involve the other tissue

cells. Individuals who possess such sensitiveness and particularly those whose general tissue cells are affected, are much more susceptible to the induction of reactions from serum injection than the normal or non-allergic person. Injection of serum into such individuals (called *secondary injection* or *re-injection*) is likely to produce a much severer type of reaction within a space of time which is less than the incubation period of the ordinary delayed type of serum sickness. If the reaction comes on immediately, it is termed an *immediate serum reaction* (of the secondary type). When it occurs after a few hours and within three days, it is called an *accelerated serum reaction*. The symptomatology of these secondary reactions is similar to that of serum sickness, except that they are more intense and distressing. Symptoms of shock may occur in the severer types and fatality may result, although it is rather uncommon. Urticaria and angioneurotic edema form a prominent part of these reactions. In the immediate types, signs of prostration or shock may be present. Unusual symptoms may also be noted, as for example, hemorrhage from the bowel; hematuria; edema of the larynx, sufficient to require tracheotomy; severe local purpuric eruptions or severe local Arthus-like necrotic reactions at the site in which the serum was reinjected.

Secondary serum reactions, whether immediate or accelerated, occur only after the reinjection of serum into patients previously sensitized to horse serum by a primary injection. Such sensitization may result either from previous injection of immune serum or more frequently from toxin-antitoxin administration. Sensitization does not develop necessarily in every patient who receives serum. A great deal depends upon the nature of the primary serum, the amount given, the route of administration and the capacity of the injected individual to acquire sensitization. It is much more frequent, however, in those who develop serum sickness. That these individuals also are more likely to develop reactions upon reinjection is indicated in the following study reported by Gordon and Creswell:

INCIDENCE OF SERUM REACTIONS AFTER THERAPEUTIC SERUM INJECTION

History of Previous Injection	Number	Percentage Of Serum Reactions
None	1750	16
Therapeutic serum only.....	151	43
Diphtheria Toxin-antitoxin	556	74.1

Reactions were much more frequent in patients who received a primary injection of therapeutic serum or in those who had toxin-antitoxin than in those who had never received any form of serum. They also found that reactions from immune serum given after toxin-antitoxin injection were generally more severe and included more

immediate types of reaction than occurred in either of the other two groups. These observations were corroborated in a study of serum sensitization after toxin-antitoxin reported in 1932 by Tuft, in which it was shown that after the administration of diphtheria toxin-antitoxin containing minute amounts of horse serum, sensitization of a varying degree occurred in 27.9 per cent of the children. This sensitization affected not only the skin but also other body tissues and was much more likely to occur in children who were allergic themselves or came of allergic families. Information obtained by means of questionnaires sent to pediatricians indicated that reinjection of therapeutic serums into children who had previously received toxin-antitoxin produced serum reactions, often of a severe type, in approximately 50 per cent, in spite of the fact that tetanus antitoxin and to a lesser extent diphtheria antitoxin constituted the principal serums used for injection.

Secondary serum reactions occurring after reinjection, especially the immediate type, possess certain resemblances to the anaphylactic reactions in the guinea pig. In both instances, there is a period of incubation after the initial sensitizing dose and the reaction occurs upon reinjection only after the completion of this incubation period. In both instances, the reaction is severe and may be fatal. Because of this similarity, some writers consider the secondary serum reaction an example of an anaphylactic reaction in the human being. The most important objections to that viewpoint are the lack of adequate proof that such reactions are the result of antigen-antibody reaction as in the guinea pig and also the failure of desensitization methods in the human. While these objections seem valid from an academic standpoint, nevertheless the reaction occurring after reinjection probably represents the closest prototype in the human being to anaphylaxis in the guinea pig and is possibly similar in its mechanism.

The reactions thus far discussed represent the most common type of serum reactions and occur either in normal individuals or in those who have an induced serum hypersensitiveness. Both serum disease and the secondary serum reactions after reinjection have many features in common. Their incidence and severity are dependent upon similar factors; their symptomatology is similar except that in the latter type they usually are more severe and distressing. Fatality may occur in the latter type but is uncommon. As a contrast to these reactions is one which occurs in an individual who has never previously received a sensitizing injection of serum and yet is markedly sensitive to horse serum. Such hypersensitiveness is spoken of as *primary, natural or atopic serum allergy*. It nearly always occurs in individuals who have the inherited or atopic type of allergy or have an allergic family history. They frequently have allergic asthma and often possess a concomitant sensitiveness to horse dander of such a degree that they cannot go near a horse without manifesting either coryzal or asthmatic symptoms—hence, the use of the term "horse-asthmatic."

The introduction or primary injection of serum into these individuals, even in small amounts, is likely to be followed by an extremely severe or even fatal type of serum reaction known as *primary or atopic serum reaction*. It differs both in severity and symptoms from the secondary type of serum reaction or serum sickness. Fortunately it is very uncommon. Definite statistical data as to its incidence is not available although it has been estimated by Park that fatal reactions of this type occur approximately only once in every seventy thousand individuals injected. Although most of these individuals are horse-asthmatic, a very small percentage have no allergic manifestations at all.

The symptoms of this reaction begin almost immediately after the administration of the serum. Almost before the needle is withdrawn, local itching and edema (or in intravenous cases, general burning) develop. These are followed in rapid order by a generalized urticarial eruption, sneezing, itching of the throat, swelling of the face, neck and extremities, cough, constriction in the chest or definite and marked asthma. These symptoms are similar to those of other allergic disorders and differ from those of ordinary serum sickness or secondary serum reactions, since in the latter coryza and asthma are conspicuously absent. In the severer type, signs of collapse quickly ensue and death may result within a few minutes after the serum administration or be delayed for several hours. If the reaction does not terminate fatally, the symptoms may simulate those of serum sickness at once or after a short interval.

The mechanism of the primary or atopic type of serum reaction is similar to that which occurs in other allergic conditions of the natural or atopic type—namely, the result of interaction between the allergen (horse serum) and the circulating allergic antibody (reagin) present in large amounts in the patient's blood. The reaction which ensues is that of allergic shock and affects primarily the specifically sensitized cells located in certain tissues or shock organs *e. g.* respiratory mucosa). It differs from the secondary serum reactions in the same manner as anaphylactic reactions in the lower animal differ from the allergic or atopic reactions of the human being.

Appreciation of the possible occurrence of these types of serum reactions is extremely important from a practical standpoint, whenever it is necessary to administer any type of foreign serum to a patient. Recognition of the presence of serum sensitiveness can be made usually without difficulty and should be done in every instance. *The fear of possible serum reaction should never under any circumstances prevent the administration of serum to any patient who requires it.* Serum reactions occur on the whole too infrequently to warrant its restriction.

On the other hand, therapeutic serums should not be given indiscriminately or with the thought that their administration can produce no ill-effects other than that of a mild serum sickness. This is especially true of tetanus antitoxin given for prophylactic purposes. This preparation has been so refined and concentrated that

only a comparatively small amount (1 cc.) need be administered. While the injection of this amount in a normal individual produces serum sickness in only a small percentage of individuals (8 per cent, according to Weaver), its administration to children previously sensitized by toxin-antitoxin produces a greater number of reactions, some of which may be extremely severe or alarming. It is not at all uncommon to obtain a history of severe serum reactions produced by prophylactic injections of tetanus antitoxin given without due precau-

tions by hospital residents or practitioners to children with puncture wounds. Institution of proper prophylactic measures would have been successful in many instances either in preventing serum reactions entirely or in reducing their severity or, in rare instances, in preventing a fatal outcome. Such precautionary measures are included in the following outline of procedure, suggested by the author for use by the practitioner in every patient to whom foreign serum of any type is to be administered:

OUTLINE OF PROCEDURE FOR SERUM ADMINISTRATION

DIAGNOSTIC STUDY	
History	Inquire for: (1) The presence of asthma, hay fever, eczema, migraine, etc., in patient or patient's family. If patient has asthma, determine whether this occurs in the presence of horses. (2) Previous injection of immune serum (e. g., tetanus antitoxin) or of diphtheria toxin-antitoxin (3 injections).
Skin Test	Routine in every patient. Inject intracutaneously 0.02 cc. (1/50) of either horse serum or immune serum diluted 1:10 with either buffered or normal saline solution. In patients who are horse-asthmatic use a 1:100 dilution. Read reaction in 10 minutes and record as negative, slight, moderate or marked, depending upon size of wheal and surrounding area of redness.
Eye Test	To be performed only when skin test is positive. Instill one drop of serum into conjunctival sac and watch for reaction (inflammatory) occurring within 10 minutes. Whole horse serum, normal or immune, can be employed in adults giving slight positive reaction; 1:10 dilution in children or in adults with moderate or marked positive skin reactions and 1:100 dilution in horse-asthmatics or in patients giving positive allergic history and marked positive skin tests. One drop of adrenalin (1:1000) instilled into eye allays any severe reaction.
PROCEDURE	
Skin Test Negative, History Negative	Serum administration safe by any route. Delayed reaction or serum sickness may occur but is never fatal.
Skin Test Negative, History Positive	Serum administration nearly always safe. Administer serum slowly and have adrenalin ready to be administered in doses of 0.25 to 0.5 cc., if signs of immediate reaction (itching or burning of skin, or constriction of chest) appear.
Skin Test Positive, Eye Test Negative	Immediate reaction possible especially if serum is to be given intravenously. If history is positive, avoid intravenous injection when possible or employ heterologous serum. If latter is not obtainable, attempt "desensitization" with spaced injections, coincident or combined with adrenalin injection. It is usually possible to administer total quantity of serum in this way without the production of serious serum reaction.
Skin Test Positive, Eye Test Positive	Immediate serum reaction extremely likely and may be severe or dangerous, especially in asthmatic patient. Avoid serum injection or employ heterologous type. Attempts at desensitization likely to fail because sufficient serum cannot be given without inducing immediate reaction. It should never be attempted in "horse-asthmatics."

METHOD OF "DESENSITIZATION" IN SERUM-SENSITIVE PATIENTS

Serum to Be Given Subcutaneously or Intramuscularly	<ol style="list-style-type: none"> 1. Inject subcutaneously 0.3 cc. (5 minims) adrenalin chloride 1:1000 and at the same time 0.05 cc. (1/20) of serum. 2. Repeat serum injection at one-half hour intervals giving in order 0.1 cc., 0.2 cc., 0.5 cc., 1.0 cc., 2.0 cc., 4.0 cc., until total amount is given. 3. Repeat adrenalin injection (0.3 cc.) at hourly intervals until all the serum has been administered. Increase dose to 0.5 or 1.0 cc. if signs of serum reaction occur. Adrenalin may be given in same syringe as serum. Dosage should be modified in children according to their age.
Serum to Be Given Intravenously	<ol style="list-style-type: none"> 1. Proceed as above, giving small doses subcutaneously until 1.0 cc. dose of serum has been given. Use same adrenalin dosage and continue at hourly intervals until all the serum has been administered. 2. One-half hour after subcutaneous injection of 1.0 cc. dose, inject slowly 0.1 cc. of serum diluted to 1 cc. with normal saline and given intravenously. Repeat at one-half hour intervals giving in order 0.2 cc. diluted to 1 cc., 0.5 cc. diluted to 1 cc., 1 cc., 2 cc., 4 cc., etc., until all the serum is administered. 3. If there is the least sign of a reaction (dyspnoea, palpitation, itching or burning of the skin) discontinue injection immediately and inject adrenalin (0.3 to 0.5 cc.) depending upon severity of symptoms. After these symptoms disappear, start injections again but at a much lower level.

By employing the procedures just outlined, it should be possible to detect the presence of serum sensitiveness in nearly all instances and to prevent or minimize the severity of serum reactions. It must be remembered, however, that too much reliance cannot be placed upon these methods of so-called "desensitization." Fatalities have occurred in patients who received a second injection of serum (usually intravenously) after methods of "desensitization" had been instituted. Serum-sensitive patients should be watched carefully for any untoward symptoms or signs and treatment discontinued as soon as they appear. If an immediate reaction occurs in spite of precaution, it should be treated actively by prompt and repeated injections of adrenalin in sufficiently large amounts to overcome the acute symptoms.

Conclusions

In spite of the greater concentration and refinement of therapeutic serums, the incidence and severity of serum reactions, particularly of the secondary type, seems to have increased considerably in recent years. This is due largely to the presence of serum sensitization or allergy induced in individuals by a previous injection of either toxin-antitoxin (equine) or therapeutic serum. By employing diagnostic and prophylactic methods similar to those herein outlined, it should be possible to recognize the existence of serum sensitization in practically every instance and to institute proper precautionary measures. This would accomplish much toward minimizing any discomforts and dangers incident to serum therapy.

The Treatment of Bacterial Allergy*

Grafton Tyler Brown, B.S., M. D., F.A.C.P.

Washington, D. C.

AS THE diagnosis of bacterial allergy has been dealt with in a recent paper¹, this article will be limited to a discussion of the specific treatment of bacterial allergy.

Where definitely positive reactions are obtained to cutaneous tests with stock bacterial proteins, gratifying results can usually be obtained from proper treatment with stock polyvalent vaccines, or autogenous vaccines or vaccine-filtrates, of the corresponding organisms. When definite reactions occur with two or more different bacterial proteins, the vaccines of the reacting organisms are mixed in equal proportions for treatment purposes. Stock and autogenous vaccines may be combined in the same mixture.

Stock polyvalent vaccines, and autogenous vaccines or vaccine-filtrates, are made preferably in a concentration of 5 billion (5000 million) organisms per cubic centimeter, in order that the maximum doses necessary for the best results, may be attained. These strong vaccines may be used undiluted for treating the less sensitive patients. Such vaccines, however, are too strong for the early doses in patients who are sufficiently sensitive to give definitely positive reactions to "scratch" tests with bacterial proteins, or who manifest focal or constitutional symptoms from the diagnostic intradermal vaccine tests. It becomes necessary, therefore, to dilute these strong vaccines ten times, to a concentration of 500 million organisms per cubic centimeter. In some cases, notably in arthritis, the concentrated vaccines must be diluted one hundred times, to a strength of only 50 million organisms per cubic centimeter. For the sake of convenience, vaccines or vaccine-filtrates containing 5000 million organisms per cubic centimeter will be spoken

of in this article as strong vaccines; vaccines containing 500 million per cubic centimeter will be termed weak; and those containing 50 million per cubic centimeter, very weak. Sterile normal salt solution containing 0.4 per cent phenol or tricresol is used as diluent, nine parts of diluent being added to one part of vaccine to make the next weaker vaccine.

For those patients who give positive cutaneous reactions to the dried bacterial proteins, or who report focal or constitutional symptoms from the intradermal vaccine tests, treatment is started with a dose of about 50 million organisms or 0.1 cc. of weak vaccine. The dose of the weak vaccine is usually increased by 0.1 cc. each time until a dose of 0.9 cc. is reached; then a change is made to the strong vaccine with a dose of 0.1 cc., which is the equivalent of 1.0 cc. of the weak vaccine. The strong vaccine is then increased by about 0.05 cc. each time to a maximum of 2.0 cc. or 10 billion organisms. These progressively increasing doses are administered at weekly intervals, or never oftener than every five days. It is preferable to alternate the arms for the inoculations.

If, for some reason, a patient's treatments are interrupted, it becomes necessary to decide what dose to give when they are resumed. If approximately two weeks have elapsed since the last treatment, it is best to repeat the same dose. If approximately three weeks have elapsed, it is advisable to go back to the dose of the next to the last treatment, and so on. In other words, the number of doses to count back is one less than the number of weeks that have elapsed since the last treatment.

The treatments are stopped when the maximum dose is reached, providing the patient is clinically well, and

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is also desensitized, as indicated by failure to react on repetition of the previously positive bacterial skin tests. If further treatment is indicated, the maximum dose of vaccine should be repeated at weekly intervals, and with lessening local reactions, the interval between the doses may be gradually widened to a maximum of one month.

It is desirable to obtain a satisfactory local reaction from each injection of the vaccine, namely, some reaction about the site of the inoculation which persists for a period of forty-eight hours. The patient is instructed to examine his arm carefully the next day about twenty-four hours after each treatment, and again the second day about forty-eight hours following the inoculation, to see whether there is a pink spot on the arm, and if so, about how large it is each day; also to note whether there is any swelling, itching, fever, hardness, or soreness of the arm both days. This information on the local reaction is used in properly regulating the next succeeding dose. I always endeavor to increase the doses so as to maintain a satisfactory local reaction. For example, if a dose or increase of 0.1 cc. gives a forty-eight hour local reaction, the next dose is increased by 0.1 cc., and so on. If, however, a dose or increase of 0.1 cc. gives only a twenty-four hour reaction that is gone entirely in forty-eight hours, the next dose should be increased by 0.15 cc.; whereas if a dose or increase of 0.1 cc. gives no local reaction whatever at either the twenty-four or forty-eight hour periods, the next dose should be increased by 0.2 cc. If any dose produces a severe local reaction, that is, one extending below the elbow or into the axilla, this same dose should be repeated for the next treatment, or even reduced a little. If any individual treatment produces what seems to be a focal or constitutional reaction, in the form of an aggravation of allergic symptoms during the forty-eight hour period following the injection, the next dose should be reduced to the size of the one before it which failed to produce such reaction, or at least half-way between the constitutionally reacting dose and the preceding one; and from then on, the doses should be increased more cautiously.

Tuberculin syringes should be used for accurately measuring all vaccine doses up to 1.0 cc., as it is frequently necessary to increase the doses by only 0.01, 0.02, or 0.03 cc. each time. In judging how much to increase the doses, it is helpful to inquire whether the local reaction from the last treatment was more, the same, or less than the reaction from the treatment just preceding that one.

It hardly seems worthwhile to call attention to the necessity for absolute sterility of all vaccines, hypodermic syringes and needles, but this is important, as an infected or abscessed arm is an unpleasant episode in an otherwise placid course of inoculations. Ordinary tincture of iodine diluted with an equal quantity of ethyl alcohol makes a satisfactory antiseptic solution for sterilizing the skin surface just prior to the injection.

There is one type of constitutional reaction that occasionally occurs in bacterial vaccine therapy, which is never encountered in treatment with food, animal epidermal, pollen, or other types of protein extracts. This distinctive type of constitutional reaction is more likely to occur following the larger doses of strong vaccine, and manifests itself within an hour, or at most several hours, following the injection. It takes the form of a chill, accompanied by fever which may be quite high, with malaise, and even generalized aching, thus simulating quite closely an attack of grippe or influenza. After a few hours, however, the temperature returns to normal, and by the next day the patient has usually fully recovered except for a feeling of weakness which soon passes off. Treatment of these shock reactions consists of the oral administration of ephedrine, or ephedrine and amytal, and rest in bed during the brief febrile stage.

This relatively uncommon type of constitutional reaction is apparently due to accidental injection of some or all of the vaccine dose into a blood vessel, and is, as we would expect, usually attended by a smaller local reaction, or even none at all. Although such a reaction may not be dangerous, it is decidedly unpleasant, and may cause a nervous patient to terminate the treatments abruptly. The way to prevent these bacterial protein shock reactions is to keep the vaccine from directly entering the bloodstream. Because of its lack of vascularity, the best site for the treatment injections is in the outer part of the upper arm, about midway between shoulder and elbow. After the hypodermic needle has been inserted subcutaneously, and before any of the vaccine is injected, the piston should be sharply retracted to see if any blood comes back into the syringe. If blood appears, the needle should be withdrawn and inserted in another spot, and the piston retraction repeated, before the dose of vaccine is actually injected. The vaccine should be injected slowly, and with the larger doses, the piston should be retracted several times during the course of the injection to make sure that the tip of the needle has not slipped into a small blood vessel.

In addition to specific vaccine therapy, foci of infection any place in the body should be removed as completely as possible. All abscessed teeth should be extracted. In some cases, all devitalized teeth should also be extracted even though the X-rays show no evidence of periapical bone destruction, as practically all pulpless teeth are infected. Chronically diseased tonsils should be enucleated. Infected sinuses should be drained. Chronic endocervicitis should be treated by cauterization, and the infected prostate gland should be massaged. Patients with abnormal intestinal flora should be given sodium ricinoleate, followed by acidophilus milk and lactose, or lacto-dextrin.

When a definitely positive reaction is obtained to a von Pirquet test, treatment with tuberculin is indicated, provided that the presence of active tuberculosis has been carefully ruled out. The method of treating with

tuberculin is the same as that already described for bacterial vaccines, except that much weaker dilutions are usually required. Using as diluent, sterile distilled water containing 0.2 per cent tricesol, 1 to 10, 1:100, 1:1,000, 1:10,000, 1:100,000, and 1:1,100,000 dilutions can be prepared from sterile undiluted tuberculin (O. T.) human type, which is commercially available in 1 cc. rubber-capped vials. There are two ways of determining the initial dose of tuberculin. One is by the size of the diagnostic reaction from a scratch test with undiluted tuberculin, namely, if a plus two (++) reaction, the treatment may be started safely with 0.1 cc. of a 1:1,000 dilution of tuberculin; if a plus three (+++) reaction, the treatment may be initiated with 0.1 cc. of a 1:10,000 dilution; if a plus four (++++) reaction, treatment may be begun with 0.1 cc. of a 1:100,000 dilution, and so on. The other way of finding the initial dose is by testing the individual patient with the various tuberculin dilutions, and then using for the first treatment, 0.1 cc. of the strongest dilution which fails to react any more than the control test. The doses of all tuberculin dilutions weaker than 1 to 100 are increased in the same manner as weak vaccines. Doses of the 1 to 100 tuberculin dilution are increased in the same way as strong vaccines, namely, by about 0.05 cc. each time. On reaching the 1 to 10 dilution, however, the doses are increased each time by only 0.01 cc., or a multiple thereof, depending upon the reaction from the preceding treatment. The undiluted tuberculin is never used for treatment purposes.

Case Reports

A few illustrative cases will now be briefly reported.

R. C., a boy of 6 years, was brought to me with asthma, which he had developed at the age of 3, following scarlet fever. He never had asthma without a cold, but was very susceptible to colds, especially in the winter. He also had sneezing and running of the nose in the summer, which his parents described as hay-fever. He coughed a good deal with his asthmatic attacks, some of which were severe enough to require epinephrine hypodermically. Thorough skin testing was done, including tests with pollens and bacterial proteins, but with completely negative results. This patient was first treated with a stock mixed respiratory vaccine, but as the asthmatic attacks recurred in spite of these inoculations, cultures were taken from his nasal secretions and sputum during an attack. *Staphylococcus aureus*, *Streptococcus hemolyticus*, and *Streptococcus viridans* were isolated and used for the preparation of autogenous vaccines. Intradermal tests with these three autogenous vaccines, gave a marked reaction to *Streptococcus hemolyticus*, a moderate reaction to *Staphylococcus aureus*, and no reaction to *Streptococcus viridans*. Treatment was instituted with a mixture of the two reacting vaccines, starting with a dose of 0.05 cc. of strong vaccine, which was gradually increased at weekly intervals. These injections were continued over a considerable period of time until the supply of his auto-

genous vaccines was exhausted. A polyvalent vaccine-filtrate mixture containing the three types of organisms found in his original cultures, was then substituted and continued to a maximum dose of 2.0 cc. of strong vaccine. A number of times during the course of these injections, both autogenous and stock polyvalent, increases in dosage were followed by temporary aggravation of colds or asthma. Four years after this patient was discharged completely well, he reported that he had remained entirely free of asthma and colds since the termination of the vaccine treatment.

Mrs. P., 28 years of age, was referred to me because of arthritis, urticaria and severe angioneurotic edema, which had started some eight months before, following the extraction of an abscessed tooth. At various intervals after that, four other abscessed teeth had also been extracted. Her trouble started with swelling of the fingers, and then the toes and heels were affected. The joints became red and swollen, and were very painful. The swelling would stay a day or two in one joint and then jump to another. Her elbows and larger joints were not involved until later, and they were not so badly swollen. Two or three weeks after the trouble started, her lips became swollen, and the swelling gradually spread to other parts of her face. At times her eyelids were swollen shut. The swellings stung, and were very sensitive. Her body finally became practically covered with hives of various sizes, which lasted about ten days. When I first saw this patient, the swellings involved principally her eyes and mouth, although she still had some on her body. Her arms, legs, and body itched a great deal. At one time she had a very large swelling in her throat, which was relieved by an injection of epinephrine. I also found it necessary to administer epinephrine on three different occasions, for the relief of marked swelling about her mouth. She had not been entirely free of urticaria or angioneurotic edema at any time during the preceding eight months. She stated that eating chocolate made her break out in pimples. Her skin tests were all negative with the exception of a delayed positive reaction to chocolate, and a mildly positive reaction to orris root. She was advised to eliminate chocolate from her diet, and to avoid the use of cosmetics containing orris root. Cultures from the roots and sockets of the last two teeth extracted showed *Streptococcus hemolyticus* and *Streptococcus viridans*. When tested intradermally with autogenous vaccines of these organisms, she gave enormous reactions. The reaction to *Streptococcus hemolyticus* was 4 inches in diameter, and *viridans* was 2 inches across. She was treated with these vaccines in gradually increasing doses, and the arthritis, urticaria and angioneurotic edema disappeared. This patient was so well that she voluntarily discontinued her treatments before reaching a maximum dose, but reported over three years later that she had had no recurrence of the arthritis or angioneurotic edema, although she still had an occasional small hive.

Mrs. G., 43 years old, was referred to me with angioneurotic edema, affecting principally her lips. The

trouble had started six years before, with attacks of swelling about the eyes, and an urticarial rash on the neck and various parts of the body. She had had a great many of these attacks at varying intervals; but in the preceding year they had occurred much more frequently, and her lips had become affected. The attacks came on quite suddenly. The first symptoms noted were itching and burning of her lips. Then the lips would swell for several hours, until they were two or three times their natural size. They then looked as if they were filled with water, similar to a large blister. This swelling was accompanied with a feeling of tightness, and at times intense pain. After a certain amount of swelling, the lips would break open and discharge a sticky fluid which would dry and form crusts. When the lips would break, the tightness would be relieved, but naturally they were very sore afterwards. These attacks would last about a week, and her nervous system was considerably upset by them. She thought that the trouble was due to eating sea food, but cutaneous and intracutaneous tests for protein sensitization were all completely negative. Her upper left first molar was the only devitalized tooth. Even though there was no radiographic evidence of pathology, this devitalized tooth was extracted, and cultures from the roots and socket showed *Staphylococcus pyogenes aureus* in pure culture. She was given injections of an autogenous vaccine prepared from the tooth cultures, starting with a dose of 50 million organisms and working up to a maximum of 1.5 cc. of strong vaccine. As a result, this patient was discharged well, about nine years ago, and has had no angioneurotic edema since.

Miss M., aged 17 years, was first seen at home with the most severe generalized eczema that I have ever encountered. This skin trouble had developed two years previously, and had been moist from the start. Innumerable prescriptions had been tried, and also X-ray treatments, but without any relief. When the eczema was bad she had fever, and there was scarcely any part of her body that was not involved. When I first saw her, she was confined to the bed with a temperature of 101°, and was broken out from head to foot. Examination revealed pus exuding from her ears, vagina and other orifices. Her scalp was affected also. The hair was matted down, and eventually all of it fell out. A definitely unpleasant odor was noted upon entering the sick room. The correct dermatological diagnosis was probably infectious eczematoid dermatitis. Cultures from her skin revealed *Staphylococcus pyogenes aureus* in pure

culture, and an autogenous vaccine was prepared from this organism. Treatment was started with a dose of 100 million organisms, and was progressively increased at weekly intervals. After her skin cleared sufficiently, she was tested with foods and a number of environmental substances, but with completely negative results. The vaccine treatments were continued until she was entirely free of skin trouble and had grown a healthy head of hair, at which time she stopped the treatments of her own accord. Nearly two years later, she came back with a recurrence of the old skin trouble, although in a much milder form. *Staphylococcus aureus* was again cultured from her skin, and autogenous vaccine injections gave the same gratifying results in clearing up the eczema.

J. R., a boy aged 15 years, was brought to me with typical migraine of five years' duration. These headaches had been occurring on an average of once a week. The attacks came on suddenly, yet the patient knew when they were about to begin, as objects which he looked at seemed not quite clear preceding these headaches. There was a flickering before his eyes, and he saw lights of different colors. He would lie down in a darkened room with his eyes closed, and the colored lights would pass off in about twenty minutes, leaving him with a headache which usually centered over the right eye and lasted several hours. Several doctors, including an ophthalmologist and a neurologist, had been unable to find any cause for the migraine. Skin tests were all negative, but cultures of his stool revealed large numbers of *Streptococcus hemolyticus*, and an autogenous vaccine was prepared from this organism. An intradermal test with the *Streptococcus hemolyticus* vaccine gave a moderately positive reaction, and treatment was started with a dose of 50 million organisms. The doses were gradually increased, and as a result of these injections the migraine headaches disappeared.

Summary

When any of the allergic diseases, namely, asthma, perennial hay-fever, urticaria, angioneurotic edema, eczema, or migraine headaches are due to bacterial sensitization, they can be successfully treated with vaccines or vaccine-filtrates. The specific vaccine treatment of bacterial allergy is described, and illustrated with a few case reports.

REFERENCE

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The Control of Allergic Manifestations*

By Phenyl-Propanol-Amine (Propadrin) Hydrochloride

J. H. Black, M. D.**

Dallas, Texas

PHENYL-PROPANOL-AMINE is a primary amine, an analogue of ephedrine having the formula phenyl-1-amino-2-propanol-1— $C_6H_5 \cdot CH(OH) \cdot CH(NH_2) \cdot CH_3$ and its hydrochloride is marketed under the trade name of Propadrin Hydrochloride.

Since this drug is an analogue of ephedrine it has been offered for use in the same field of therapy. The present study, carried on during the autumn of 1936, was undertaken to determine its value in the relief of acute allergic reactions.

There were 131 patients studied, divided into the following groups: asthma 45, seasonal hay fever 60, perennial hay fever 18, urticaria and angio-neurotic edema 8.

The persons with asthma, without regard to their etiologic factors, were given the drug for relief while their examination was going on or in order to control or prevent attacks during treatment. The seasonal hay fever patients all were sensitive to ragweed pollen and approximately half of these had had no pollen therapy or were being given co-seasonal treatment, while the others, in spite of pollen treatment, needed added relief. Those suffering with perennial hay fever were given the drug for relief of symptoms while their examination was progressing. All those with urticaria and angio-neurotic edema were having constant or nearly continuous eruption and were given the drug to control the symptoms.

It was expected that the preparation, because of its similarity to ephedrine, would have a similar action, so it was used in the same manner as we have used the latter drug. In the larger number of patients it was used to relieve symptoms present. In others it was used in an attempt to prevent recurrence of frequent, periodically recurring attacks.

Through the courtesy of the manufacturer, the drug was supplied in capsules for oral use, and in aqueous and oily solution, and in jelly for intra-nasal application. The jelly was not used in the nose of the hay fever patients because I have always felt that patients seldom get the material high enough in the nose to give relief from swelling of the mucosa there and that subsidence of swelling there is essential to adequate drainage of sinuses and comfort of the patient. Ten hay fever patients were given an aqueous solution of the drug (one per cent) for use as nasal drops, and five used an oily solution in the same concentration. All other patients used the drug in capsule. Capsules were used almost to the exclusion of other forms of medication

because I have believed, in using ephedrine, that relief obtained in hay fever by capsules lasted longer and was more complete when obtained and made unnecessary frequently repeated instillation into the nostrils, which, after a time, may cause considerable irritation.

Patients using the solutions in the nose were instructed to repeat instillation every two hours if required. Those using capsules were given 24 milligrams every three hours if necessary and doses of 48 milligrams were given to many.

The hay fever patients who used the aqueous and oily solutions in the nose reported results entirely comparable to those of ephedrine. As well as could be determined, the degree of relief is the same and there were as many complaints of pain after its use. One patient, accustomed to the use of a synthetic ephedrine, thought it better than the propadrin. The number of patients in this group was so small that conclusions can be only tentative.

In patients suffering from asthma and hay fever the drug by mouth was found to have apparently the same efficacy in relief of attacks as does ephedrine. Of the 45 patients with asthma, 26 had been using ephedrine (usually with a barbiturate) and of these, four stated they got better relief from ephedrine, while 15 believed the reverse was true. The other seven could see no difference in the amount of relief obtained. The 19 who had not used ephedrine could not make their own comparison but our opinion was that the relief from a single dose came as quickly, was as definite, and lasted as long as did a single dose of ephedrine.

One very definite advantage in the use of propadrin was the absence of nervousness and insomnia. These symptoms, so common after the use of ephedrine, were seen in only three patients, and this made it possible to use propadrin at regular intervals over long periods of time, in this manner securing results that could not be got from ephedrine. In other words, a single dose of one drug seemed to be no more efficacious than the other, but by its continued use many patients had relief from propadrin which could not be got except by continued use of ephedrine. This could not be done, as a rule, because of the unpleasant effects.

Many asthmatic patients obtained relief from doses of 48 mgm who had no benefit at all from smaller amounts. Even the larger doses failed to relieve severe attacks but many attacks could be controlled by 48 mgm every three hours, which dosage could be maintained without ill effect. The action of the drug is relatively short. Three hours seems to be the limit of effectiveness and doses given that often produce no evidence

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**Professor of Preventive Medicine, Baylor University.

of accumulative effect. As a preventive measure it could be administered at bed time without fear of insomnia, but since its action was not prolonged we did not find it preventing attacks in the early morning hours. Forty-eight mgm doses were given to children six to eight years of age without any unpleasant effect.

The patients suffering from urticaria and angio-neurotic edema reported very satisfactory relief. The ability to use the drug at regular intervals over long periods of time was particularly valuable in these patients. We have not been able to keep this type of patient free of symptoms with other medication but consistently good results have been had from propadrin.

The ill effects or unpleasant reactions of the drug were few. Two patients complained of nausea without vomiting after several doses. Three thought their nervousness was slightly increased. None developed insomnia, even after several doses of 48 mgm at three-hour intervals. Urinary retention was not noted in any. Blood pressure readings were made before and after administration of a single 48 mgm dose of the drug. In 41 consecutive patients, without regard to age, but without hypertension, all showed variation not exceeding 15 millimeters systolic and no change in the diastolic pressure. Five patients who each used a total of eight doses of 48 mgm each—a total of 384 mgm—in two days showed no change greater than 10 millimeters in their systolic blood pressure when taken near the close of

the second day. In one patient with hypertension there was a drop two hours after a single 24 mgm dose from 170 to 160 systolic with no change in diastolic pressure. There were no other patients with hypertension in this group.

Discussion

No attempt has been made to discuss in per cent the amount of relief experienced by these patients. Since ephedrine is so generally used and its value and limitations so well known we have felt that the amount of relief could be best expressed as compared to that secured by the use of ephedrine.

While the relief obtained from a single dose is no more than that produced by ephedrine the absence of nervousness and insomnia make it possible to use propadrin at frequent regular intervals and obviates the necessity of combining with it a sedative. Used in this manner the results are definitely better than can be obtained by the usual irregular use of ephedrine.

Propadrin by mouth at regular intervals gives more prolonged relief than can be secured by intra-nasal use in solution.

The use of propadrin every three or four hours gave more relief to the patients suffering with urticaria and angio-neurotic edema than any other medication we have found.

Allergy in General Medicine*

Hal M. Davison, M. D.**

Mason I. Lowance, M. D.***

and

Crawford F. Barnett, M. D.****

Atlanta, Ga.

A FEW years ago we were invited to address this society on the subject of allergy in general medicine. On being so honored again, we accepted, because there is enough new in allergy to justify further discussion.

In our former paper we gave a résumé of allergy in general, a discussion of anaphylaxis and antianaphylaxis in animals, and drew an analogy between these reactions and those occurring in humans. We discussed the occurrence of the so-called skin reagin present in the blood of allergic individuals and the process of passive transfer. Attention was called to the general allergic phenomena of smooth-muscle spasm, edema, increased capillary permeability, itching, increased secretion of mucus, cellular changes, with an increased passage of cells into the tissues, with eosinophilia.

There is not space in this paper to go into a discus-

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**Associate in Medicine, Emory University, Atlanta, Ga.

***Assistant in Medicine, Emory University.

****Assistant in Medicine, Emory University.

sion of the allergens, nor into the various divisions of allergy. We wish to mention, however, the types of allergy, which may be briefly divided as follows:

1. *Atopy*, which includes those forms of allergy which are supposed to be controlled by heredity, and characterized by specific, circulating antibodies called *reagins*. This includes asthma, allergic coryza, and certain forms of skin lesions, e. g., urticaria and allergic dermatitis.
2. *Contact allergy*, that form of allergy which occurs in humans after an exposure by contact to various substances; after an interval of time, the allergic reaction may be precipitated by further exposure to the sensitizing substance. Skin reagins do not exist in the serum of patients suffering only from this type of allergy.
3. *Drug idiosyncrasies*, that type of allergy in which there is an unusual reaction produced by the injection or ingestion of non-toxic doses of a drug, or by

the application of a drug to the mucous membrane or to the skin.

4. *Bacterial allergy*, sometimes called the *tuberculin type* of allergy, that form of allergic reaction caused by an injection or infection following a sensitization of the individual by a previous injection or infection. It is characterized by the presence of allergic manifestations, mainly in the nature of a delayed subcutaneous reaction following injection of the proteid of the offending bacteria and by a focal reaction at the site of infection distant from the point of injection or at the sites of former injections.
5. *Serum sickness*, that form of allergy which occurs in about 90 per cent of white persons following the injection of a foreign blood serum.
6. *Physical allergy*, that form of allergy produced by such physical agents as light, heat, cold, or mechanical irritations in amounts ordinarily harmless to humans.

Attention was called to the fact that allergic individuals may be in a state of allergic equilibrium, during which time they may come in contact with allergens without demonstration of symptoms, and that there are certain precipitating factors or "trigger elements" that disturb this equilibrium and allow symptoms to manifest themselves.

A discussion of heredity was given. We may state here that certain members of the allergic society are attempting to prove that allergy is not hereditary. It is still an open question.

During the past few years many more symptoms formerly unexplained have been shown to be allergic in certain patients. It is our object today to give a list of these various manifestations that affect the different anatomical and physiological systems of the body, and to give a brief discussion of some of the newer methods of diagnosis.

The main allergic manifestations that have been demonstrated in the various systems are as follows:

1. Central Nervous System.
 - (a) Allergic headaches, without typical migrainous symptoms.
 - (b) Migraine.
 - (c) Epileptiform seizures.
 - (d) Psychic disturbances, personality changes.
 - (e) Neuralgia.
 - (f) Transient paralyses.
2. Eyes.
 - (a) Eczema and edema of the lids.
 - (b) Conjunctivitis, with or without accompanying allergic coryza (hay fever).
 - (c) Vernal catarrh.
 - (d) Edema of the head of the optic nerve.
 - (e) Keratitis and ophthalmia produced by specific sensitiveness.
3. Nose and Accessory Sinuses.
 - (a) Recurring attacks of allergic coryza (hay fever), simulating head colds.
 - (b) Vasomotor rhinitis.
 - (c) Allergic coryza (hay fever).
 - (d) Polypoid swelling in the sinuses.
4. Bronchi and Lungs.
 - (a) Allergic coughs.
 - (b) Asthmatic bronchitis.
 - (c) Bronchial asthma.
 - (d) Transitory edema in the lung tissue.
 - (e) Croup.
5. Gastro-Intestinal Tract.
 - (a) Canker sores in the mouth.
 - (b) Acute gastro-enteritis, with nausea, vomiting, diarrhea, and pain.
 - (c) Acute pain like cholecystitis and certain other right abdominal symptoms in the region of the liver, with or without slight jaundice.
 - (d) Peptic ulcers.
 - (e) Mucous colitis.
 - (f) Essential hemorrhages.
 - (g) Pylorospasm and possibly certain cases of pyloric stenosis in the new-born.
6. Cardiovascular System.
 - (a) Hypertension.
 - (b) Hypotension.
 - (c) Cardiac irregularities.
 - (d) Buerger's disease.
 - (e) Anginal pain.
7. Genito-Urinary System.
 - (a) Hemorrhagic nephritis.
 - (b) Renal colic, produced by spasm or edema in the ureters.
 - (c) Essential hematuria.
 - (d) Cystitis and irritable bladder.
 - (e) Enuresis.
 - (f) Dysmenorrhea.
8. Skin.
 - (a) Eczema and various other dermatoses.
 - (b) Urticaria.
 - (c) Angio-neurotic edema.
 - (d) Purpura.
 - (e) Erythema nodosum.
 - (f) Erythema.
 - (g) Itching over the body.
 - (h) Pruritus ani and vulvae.
9. Joints, Tendons, Muscles.
 - (a) Arthritis.
 - (b) Intermittent hydrarthroses.
 - (c) Transient edema in tendon sheaths.
 - (d) Muscular pains about over the body.

10. General Manifestations.

- (a) Fever without other allergic manifestations.
- (b) Allergic shock.
 - i. Subnormal temperature.
 - ii. Slow pulse.
 - iii. Lowered blood pressure.
 - iv. Prolonged coagulation time.
 - v. Increased non-proteid nitrogen in the blood.
 - vi. Decreased blood chlorides, calcium, and phosphorus.
 - vii. Leukopenia.

We realize that the following discussion is not orderly and is quite disconnected, but for the sake of brevity we cannot make a full discussion, and can only mention certain new and interesting points relative to the various manifestations listed above.

Formerly it was considered that of the headaches only typical migraine might in some cases be allergic. It has been proven that many headaches without nausea and without disturbance of the speech center are allergic in origin.

In the treatment of allergic headaches or migraine, the patient should remain at rest in a dark room with an ice cap on the head. A saline laxative should be given to clear the gastro-intestinal tract of possibly offending foods. In addition to this, the patient may be given aspirin or a capsule containing acetanilid, pyramidon, and codeine, or ephedrine and amylal may be given. If the patient is vomiting, an injection of an ampoule of novaldin may be given intramuscularly. Gynergen, $\frac{1}{2}$ cc. to 1 cc. intramuscularly, may also be used.

Cases of cerebral allergy consisting of epileptiform seizures, psychic disturbances, transient paralyses, are comparatively rare, but no doubt many of these cases in the past have not been diagnosed accurately, or have been overlooked. We wish to call your attention to some of the cases we have seen in the last three years.

One case was a boy in preparatory school, who fell on the football field and was brought in for examination. Nothing was found to account for his attack. It was thought that he had stumbled and hit his head on the ground, thus producing concussion. Later on, he had other attacks, which were finally proven to be allergic. This boy, while on a visit to another city, had a diagnosis of brain tumor, and was advised to see a brain surgeon at once. We were called, and advised adrenalin, the use of ephedrine and amylal, and the intravenous injection of calcium chloride. The patient recovered at once.

A girl student in a South Carolina preparatory school came complaining of nervousness, headache, inability to speak, and numbness with partial paralysis. We made a provisional diagnosis of hysteria, but upon going into the case further, discovered a marked family history of allergy, and skin tests showed marked reactions to many inhalants and foods. This patient has had no more attacks.

A young lawyer complained of attacks of headache, dizziness, followed in one instance by unconsciousness, and in others by weakness and inability to say what he

wished to say. He had discovered for himself that his attacks followed the ingestion of eggs and sea food.

No doubt other cases have passed by us unrecognized.

In treating allergy of the nose and accessory sinuses, the surgeons have become much more careful about the use of operative treatment. It has been proven that many cases with symptoms simulating sinus disease or of polyps in the sinuses may be allergic in origin. The work of Alexander and of Hansel of St. Louis has shown that ionization is not the proper treatment for allergic coryza, that in some cases it actually does harm, and that it does not prevent return of symptoms within a few weeks or a few months.

It has been shown in the last few years that foods often play a part in the production of allergic coryza. Previously, patients with seasonal allergic coryza had been treated only by injections of pollen extracts. Rinkel and others have been instrumental in determining that many cases of season allergic coryza free of symptoms and adequately treated by the pollen extracts develop severe symptoms when eating foods to which they are sensitive. These foods do not cause symptoms at times other than the pollen season. Other inhalants than pollens to which a patient is sensitive may also cause symptoms during the pollinating season and not at other times. It is necessary, therefore, to use small amounts of other inhalants, such as house dust, orris root, animal and fowl epithelial extracts with the pollen extracts for treatment, and during the season to omit from the diet foods to which the patient has proven sensitive.

Asthma

It is desirable to treat every asthmatic individual early, to prevent the changes which are produced by asthmatic attacks, that is, emphysema, chronic bronchitis, and bronchiectasis. Bray, of London, has called our attention to the fact that asthma in infants and young children is somewhat different from that occurring in older children and adults. The attacks of asthma simulate bronchitis with wheezing; fever is practically always present, and may vary from one degree to three or four degrees. This fact has led many physicians to diagnose as bronchitis, bronchial pneumonia, or asthmatic bronchitis in infants and small children what was really a true allergic asthma. These patients should be tested and treated from the allergic standpoint.

We believe that every asthmatic should have a roentgenologic examination of the lungs. Tubercular infection exists in only an exceedingly small percentage of patients with asthma, but in certain cases the physical signs of tuberculosis are so masked by signs of asthma that the condition is overlooked. In children, the roentgenograms will sometimes show the existence of enlarged tracheobronchial nodes, and in certain cases roentgen-ray therapy through the hilum will cause the disappearance of these nodes and relief of asthmatic attacks.

Bivings, of Atlanta, was the first to show that croup is often caused by sensitivity to foods. This croup is entirely prevented by omitting from the diet the offending foods, and attacks are quickly relieved by the administration of ephedrine or adrenalin.

Digestive Tract

Henry of Memphis has shown that definite symptoms of gall bladder disease, at times with jaundice, may occur after the ingestion of foods to which the patient is sensitive.

Eyermann, of St. Louis, and others have conclusively shown that certain peptic ulcers are caused by sensitization to foods, and that these ulcers are cured by omitting from the diet the offending foods.

Genito-Urinary Tract

We have seen cases of allergic nephritis occurring together with urticaria, angio-neurotic edema, swelling, and pain about the joints, and at times a purpura. Some of these cases are very severe, showing actual hemorrhages in the skin, and under the skin, and some of them eventually die.

We have seen a few cases of pain in the bladder, with the urine free of albumen and any signs of infection, which were proved to be caused by the ingestion of certain foods.

Hypertension

Rinkel, of St. Louis, has shown that certain cases of essential hypertension are relieved by omitting from the diet articles of food to which the patient is sensitive, and that the blood pressure may be immediately raised to its former height by adding these foods to the diet. Rinkel tells of one case in which, following a clinical food test, the blood pressure was raised to a much higher point than formerly existed, and there followed a hemorrhagic nephritis and marked edema.

Eczema and Other Dermatoses

Stroud, of St. Louis, has called our attention to the fact that dermatoses produced by dye in clothing are now assuming importance from an industrial standpoint in the cases of workmen handling the clothing or engaged in its manufacture, and that certain stores had been sued by customers who had bought clothing which caused dermatoses. According to Stroud's account, damages were awarded the customer in some instances, although neither the store nor the manufacturer was culpable.

Urticaria

General Causes:

1. Sensitivity to foods or contactants or to drugs. Balyeat makes the statement that 90 per cent of urticaria cases not due to foods are due to the ingestion of coal-tar products. We believe this estimate too high.
2. Focal infections.
3. Intestinal toxemias.
4. Endocrine dyscrasias.
5. Combination of the above agents.

There often exists in these cases a hypochlorhydria or an acidity.

Especially in the female should the endocrine history be studied. Many cases of urticaria and angio-neurotic edema occurring at the menopause or with menstrual irregularities are relieved by the administration of theelin or theelin and antuitrin S. There has been one case of

urticaria reported due to the sensitization of the patient to her own menstrual flow. This patient gave a positive skin reaction to the extract of the menstrual flow, and was relieved by injection of this extract. Other patients have been shown to be sensitive to certain hormones, such as antuitrin S and theelin.

For the non-specific treatment of urticaria we mention the following:

Adrenalin, the injection of adrenalin and ephedrine together, ephedrin and amyral, a capsule of aspirin, ephedrin, amyral, and codeine, the intravenous injection of calcium chloride, sodium thiosulphate, or hydrochloric acid. The best sedative is chloral hydrate; next, the subcutaneous injection of sodium luminal. Some patients are relieved by the administration of pancreatic extract by mouth. Others have been relieved by the subcutaneous and intravenous injection of 5 per cent peptone, and by the use of the coliform vaccine of Coke. Still others have been relieved by the subcutaneous or intravenous injection of distilled water as advised by Schatz. For local relief, 2 per cent menthol ointment, vinegar and soda baths are helpful.

Purpura

Certain cases of purpura and cases showing the clinical manifestations of purpura with joint symptoms have been definitely proven to be due to the ingestion of foods.

Pruritus

Certain cases of pruritus ani and pruritus vulvae have been proved to be due to foods, chocolate being the most frequent offender.

Arthritis

There is no doubt that certain cases simulating arthritis and fibrositis are due to sensitivity to foods. We have had opportunity to observe closely one patient in whom pain and edema around various joints of the body occurred, edema about the tendon sheaths with production of a friction rub simulating pleurisy, after ingestion of chocolate.

The serum reaction of painful and swollen joints is well known, and we have seen this occur in practically all joints of the body, including the temporomandibular joint. In one patient this latter joint was so severely affected that there was a question of the presence of tetanus.

Fever

Different physicians have reported the prolonged occurrence of fever proved to be due to sensitivity to foods, and relieved by omitting these foods from the diet.

We have already discussed in a former paper the diagnosis of allergy through history, physical examination, laboratory tests, roentgenologic examination, and skin tests. Details of these will be omitted here. We have also discussed conjunctival tests, nasal tests, and the testing of infants and very ill patients by passive transfer. Patch tests for contact allergy have also been described.

We wish to say here that limiting too strictly the number of tests made is one of the most frequent hindrances to correct diagnosis and treatment.

It has been determined by clinical experience that skin tests are almost 100 per cent perfect for sensitivity to the inhalants, but are probably no more than 50 per cent perfect for sensitivity to foods. It has proven impossible to produce clinical reactions by feeding some of the foods to which the patient gives a strong skin test, and other foods giving no skin reaction at all to the test may produce strong clinical reactions when fed to the patient. This has necessitated the use of other methods for determining food sensitivity in a practical manner.

The Leukopenic Index of Vaughan

Vaughan and others have shown that when a food to which a person is sensitive is ingested, there is usually produced a leukopenia instead of the usual leukocytosis following ingestion of ordinary foods. The method in general is as follows:

The patient fasts for at least five hours. He is then given a fairly large quantity of the suspected food, prepared in such a manner that it can be easily absorbed. The food should be taken in five minutes' time. A leukocyte count is made just before the food is taken, then every 20 minutes or every 30 minutes (according to various methods) for three or four times. A graph of the counts is plotted, using for a base line the original count. Different investigators have worked out the interpretation of the various curves obtained.

The use of the clinical history of the patient, the results of the food skin tests, and the results of the leukopenic index combined have proven to be about 90 per cent perfect in determining sensitivity to foods.

It has been also shown that when a patient eats food in the manner described for the leukopenic index, very often an immediate clinical allergic reaction is produced. This is called the clinical food test, and, when positive, is one of the most useful of all the tests.

Treatment

The treatment of allergic conditions may be divided generally into two approaches, specific and non-specific. Specific therapy consists of:

1. Avoidance of offending substances.
 - (a) Foods as indicated by the tests.
 - (b) Inhalants shown to be positive for the patient.
2. Injection of extracts of inhalants with which contact cannot be avoided, and which are most important in the individual case.

Non-specific treatment consists of:

1. Avoidance of so-called "trigger elements" or precipitating factors, such as humidity, cold, night air, emotional upsets, infections, toxemias.
2. General treatment of the patient from the standpoint of mental hygiene, physical hygiene, nutrition, and the like.
3. Drug therapy, varying with the different manifestations, but consisting mostly of the use of adrenalin, ephedrine, synthetic preparations such as neosynephrin and benzedrine; the use of a 1-100 solution of adrenalin by inhalation for asthma; the iodides and arsenic orally or intravenously.
4. Non-specific proteid therapy, such as the use of pepsin and histamine.

5. Ether anesthesia, usually by rectal instillation of ether and oil for *status asthmaticus*.
6. Vaccines.
7. Intrabronchial injection of iodized oil for the relief of asthma.

8. Inhalation of helium and oxygen for relief of asthma.

In certain cases of asthma it may be necessary to use morphine or some derivative of morphine, but most allergists believe that the use of morphine with adrenalin is dangerous, and that it should be used only with great care.

In any case of allergy in which other treatments have failed, the physician is justified in trying blood transfusion. This measure is not without its danger, and it is preferable that the donor be starved for 24 hours beforehand to be sure that his blood will contain as little as possible of food elements to which the patient might be sensitive.

Pregnancies and intercurrent diseases give no contra-indication for the treatment of allergic diseases.

Causes of failure are, in general, as follows:

1. Incomplete testing.
2. Insufficient hyposensitization by using too weak solutions of the allergens or by not using them long enough.
3. Using too strong solutions of the allergens and producing symptoms by injection.
4. Failure to take into consideration precipitating factors.
5. Non-co-operation on the part of the patient.

Prognosis

As a whole, the prognosis in allergic diseases is much better than that in other chronic diseases. We believe that the causes of more than 70 per cent of cases of asthma may be diagnosed, and a large percentage of these cases can be either completely relieved or partially relieved. Certainly a fair percentage of those not specifically diagnosed can be helped by non-specific treatment. More than 80 per cent of cases of non-seasonal allergic coryza can be diagnosed, and more than 90 per cent of the cases of seasonal allergic coryza can be diagnosed. Practically all of these diagnosed allergic coryza cases can be given enough relief to make the treatment worth the patient's while.

In cases of asthma and of allergic coryza, we believe it is wise for the patient to take treatment over a minimum of one year, and preferably for three years.

We cannot give such an accurate estimate of prognoses in other forms of allergy. Practically all the few cases of cerebral allergy that we have seen have been diagnosed and relieved. A fair percentage of the allergic headaches and most of the cases of urticaria have been relieved by either specific or non-specific treatment. With the other forms of skin lesions we have not been so fortunate.

In general, the outlook has grown brighter for allergic diseases as the years have added knowledge concerning the production of symptoms, and have produced better extracts for testing and treatment and better methods for the relief of symptoms by non-specific medication.

Surgery of the Tonsils

From the Anatomic Point of View

Joseph H. Kler, M.D.*

New Brunswick, N. J.

SURGERY of the tonsils has been discussed so frequently that it seems almost out of place to try to interest anyone in such a protean subject as tonsils and tonsillectomy. Certainly it is devoid of the spectacular but it can be a most interesting and fascinating surgical procedure.

Rutgers University freshmen are thoroughly examined. During these examinations we see the results of tonsillectomies done in our average communities. Most are done by general practitioners, some by general surgeons and few by properly trained otolaryngologists. If we judge this operation by the completeness of removal, symmetry of structures of the throat and lack of injury to adjacent structures we find rather few good tonsillectomies.

There are many reasons for this, including Mother Nature, who was most unkind to the tonsils in leaving them so exposed to the vicissitudes of bacteria and the medical profession. Had nature placed them deeper in the tissues of the neck, tonsil surgery would be a definitely accepted major surgical procedure. As it is today, it is "only a tonsillectomy" that "can be done by anyone" including the quack. So many instruments are on the market that are supposed to do everything perfectly. Each manufacturer guarantees his product to remove the tonsil in one fell swoop and leave all other structures uninjured. These factors are the principal reasons for unsatisfactory tonsil surgery by the profession. We can expect no better results until tonsillectomy is considered a major surgical procedure. To do so, the otolaryngologist must place tonsil surgery on a plane that is scientifically correct and to be so it must be based on sound surgical principles which respect anatomic structures. Only then will uniformly good results be assured.

The tonsil is a modified cylindrical mass of lymphoid tissue, situated in the tonsil recess, having a hood-like appearance superiorly and blending with the plica triangularis inferiorly. Its deep surface is enclosed in a fibrous capsule and its free surface is covered to a varying degree by prolongations of the capsule called plicae, over which lies a layer of mucous membrane. The tonsil arises¹ in the ventral part of the second inner branchial groove. During the third month, epithelium grows into the underlying connective tissue in the form of a hollow bud. This forms a crypt from which secondary buds and crypts develop. Lymphoid cells wander into this structure from the neighboring blood vessels and epithelium. Distinct lymph follicles with germinal centers are formed by the third month after birth. These

lymph nodules continue as germinal centers² as long as the tonsil remains normal. However, when the tonsil becomes irritated the germinal centers quickly become reaction centers. If the irritation is severe enough, only phagocytosing reticular cells are produced. When the tonsil must be a reaction center too long it becomes a definite menace.

If we could only approximate the faucial pillars the tonsil would be more nearly like a typical lymph node—a mass of lymphoid tissue completely enclosed in a capsule. But Nature split these pillars and the free ends of the capsule became prolonged and inserted themselves into the free margins of the pillars and into the lateral aspect of the base of the tongue. Fowler and Todd³ consider the capsule an artefact but if we consider the capsule proper and the muscle fascia of the tonsil fossa as one entity and call both layers of fibro-elastic connective tissue the capsule, these structures will have greater surgical significance. The tonsillar layer is firmly attached to the tonsil by various trabeculae. One of the trabeculae is so large that it practically divides the tonsil into a larger upper lobe and a smaller inferior lobe. This may well represent the hilum of the tonsil. The other layer of the capsule is closely adherent to the palatoglossus and palatopharyngeus muscles. The two layers of the capsule are held together very loosely at the upper pole and quite firmly at the base. However, Wood⁴ found firm longitudinal attachments between the two layers of the capsule which ran in the direction of the muscle fibers. Below the equator, at the hilum of the tonsil, the two layers of the capsule are firmly attached to each other by fibrous bands, blood vessels, lymph vessels, nerves and the tonsillopharyngeus muscle described by Fowler and Todd³. This muscle consists of fibers from the lateral part of the palatopharyngeus muscle. Its size varies greatly. Jason⁵ found that repair within tonsils occurs as an ingrowth of granulation tissue from the capsule, trabeculae or marginal sub-epithelial connective tissue. Thus we may have distortion of the normal produced by tonsillar as well as peritonsillar infections and scar tissue may bind the two layers firmly at any points.

The histology of the plicae is of great surgical importance. The posterior and semilunar plicae have little lymphoid issue. The lymphoid tissue found has few deep crypts—altogether unlike that of the faucial tonsil. Unless there is much lymphoid overgrowth, both plicae should be preserved. The semilunar plica is of particular importance in the post-operative cosmetic result. The triangular plica is much larger and contains lymphoid tissue which resembles that found in the

*Infirmary, Rutgers University, New Brunswick, N. J.

faucial tonsil. Fetterolf⁶ described it as arising from the free margin of the anterior pillar as a triangular fold whose apex blends with the palate while the base is inserted broadly into the lateral aspect of the tongue. The tonsil blends with this plica and we find typical tonsil crypts in its lymphoid tissue. There may be depressions or tonsillar fossae between the lymphoid tissue of the plicae and the tonsil mass proper. The superior fossa is most constant, the anterior next most constant, and the posterior least constant. Sasaki⁷ recommends naming the superior fossa. This seems unnecessary since the fossae have no anatomic significance and should have no surgical importance because they are intratonsillar furrows.

The arteries of the tonsil are characterized by an unusually thick tunica elastica interna⁸. This permits them to contract effectively when severed. Scar tissue in the capsule may interfere with this mechanism. The tonsillar arteries are all ultimately branches of the external carotid artery. Brunner and Schenerer⁹, among many others, emphasize that all types of variations in the location, number and origin of these vessels may be found. Fetterolf⁶ pointed out the most frequent points of entrance into the tonsil of these various branches. Therefore, surgically we have superiorly a small branch of the descending palatine entering the tonsil. Birket¹⁰ also reports a small branch from the small meningeal entering at this point. These vessels rarely produce bleeding either at operation or after. Anteriorly a small branch of the dorsal lingual enters the tonsil just below the equator. Usually it is small, but in tonsils that have had repeated infections this artery may be quite large and can be seen just inside the anterior pillar. Posteriorly a moderate sized branch of the ascending pharyngeal enters the tonsil just posterior and inferior to the hilum of the tonsil. This vessel is seen in the posterior recess of the palatopharyngeus muscle. Even though this is a small vessel it is frequently injured and frequently causes annoying hemorrhage. Inferiorly we have a group of arteries. They are tonsillar branches of the external maxillary, dorsal lingual and the ascending palatine. The arteries entering the lower lobe are usually the largest. They all course upward in the plica triangularis and enter the tonsil at the hilum, as a rule. If the plica is removed at its insertion these vessels contract well and very little bleeding takes place.

The venous drainage is by a plexus of veins in the wall of the recess. The largest vein starts at the upper pole and courses downward practically in the midline of the recess. Frequently this vein is found between the two layers of the capsule and when so found it is very easily injured. These veins join veins from the epiglottis and tongue to form a large trunk which joins the pharyngeal plexus of veins.

A typical lymph node has afferent and efferent lymphatic channels. Recent studies seem to disprove the presence of afferent channels to the tonsil.^{22, 23, 24} However, the lymphatics of the tonsil¹⁰ are connected with the adjacent areas of mucosa in the pharynx, mouth and lower part of the nasal cavity.

They pass chiefly to the upper cervical lymph nodes. One of these nodes is situated just behind the angle of the jaw beneath the anterior edge of the sternomastoid muscle. It is called the tonsillar lymph gland by Wood.

The sensory nerve supply is very abundant.¹¹ The most important branches comes from the glossopharyngeal nerve and the sphenopalatine ganglion. Most of these branches enter the tonsil at the hilum. There are also several branches from the posterior palatine nerve which supply the upper lobe of the tonsil.

The tonsillar recess is formed by the palatoglossus and palatopharyngeus muscles and limited superiorly by the soft palate. The function of the two muscles is to control the soft palate although the palatoglossus muscle plays a minor rôle. The palatopharyngeus muscle is very important. Fowler and Todd describe it as an inner sheath of muscular fibers disposed vertically forming a continuous layer around the pharynx between the submucosa and the superior constrictor. Above it is attached to the soft palate, Eustachian tube and base of the skull. Below the fibers lose themselves in the upper esophageal wall. This muscle may be reinforced by the stylopharyngeus. The lateral part of this muscle is of particular interest. It arises from the soft palate as far laterally as the hamular process. A reduplication of it forms the posterior pillar. In front the muscle merges with the buccopharyngeal fascia. The tonsillopharyngeus muscle is composed of muscle fibers from the lateral portion of the palatopharyngeus muscle which pierce the two layers of the capsule to enter the tonsil at the hilum.

At the extreme lower pole the palatoglossus and palatopharyngeus muscles are quite thin. They are joined here by the tendons of the muscles attached to the styloid process. The lingual and glossopharyngeal nerves are also quite superficial in this area.

Even though mild injury of the faucial pillars usually produces no symptoms, every effort should be made to preserve them intact. Dorrance¹² reports repairing a post-tonsillectomy stricture of the oropharynx. It is not unusual to see retractions of the soft palate, due to destruction of the posterior pillar, which produce definite but not unbearable symptoms. Frequently we see speech defects as the result of destruction of pillars and the soft palate. Lyons¹³ states that the quality of sounds produced depends upon the ability of the tongue and velum to stop the air column as needed. Any obstruction or abnormality in the mouth or pharynx may cause a speech defect of some degree. Makuen¹⁴ also points out the effect upon speech of various post-tonsillectomy abnormalities of the pillars and soft palate. Pillars are most frequently injured by the injudicious use of any guillotine type of instrument. However, the snare can produce extensive injury to the posterior pillar if the tonsil has not been properly dissected. Injury of the deeper layer of the capsule is always potentially dangerous. As long as the capsule is intact it is an excellent barrier to the spread of infection. Comer¹⁵ reports a case of cavernous sinus throm-

bosis in a child following a tonsillectomy with a Sluder instrument. In this case there was an injury of the capsule. Schaeffer and Carmack found seven cases of fatal hemorrhage occurring at or shortly after tonsillectomy due to injury of aberrant or anomalously placed internal carotid arteries. Salinger and Pearlman¹⁶, in a very exhaustive study of hemorrhage from pharyngeal and peritonsillar abscesses, found that the internal carotid artery is closer to the posterior pharyngeal wall than any large vessel. The internal carotid artery normally makes several curves in its course in the neck which may become exaggerated into tortuosities that will bring it into close proximity with the pharyngeal mucosa. True aneurysm of the internal carotid artery is rare but it is frequently the site of aneurysmal dilatations due to trauma or infection. We may add that if the deeper layer of the capsule is left intact, severe hemorrhage from severed tonsillar arteries is uncommon because the fibroelastic connective tissue of the capsule assists the tunica elastica of the severed arteries to seal off the lumen. Kenn¹⁷ reports less bleeding in the guillotine tonsillectomy in children. This is due as much to the separation of the two layers of the capsule as to the crushing effect of the dull blade.

One of our confrères²⁵ reports cutting off a long styloid process, which encroached upon the tonsil capsule, with a Sluder tonsillectome.

It would seem quite reasonable to conclude that careful dissection under direct vision should always prevent injury to the pillars, soft palate, aberrant or anomalously placed internal carotid arteries and if carefully done it should uniformly prevent injury to the muscle layer of the capsule.

It would be most presumptuous of me to try to tell you how to remove tonsils. Skillern¹⁸ recommends the LaForce tonsillectome in all cases except those too difficult for this method. The tags to be removed with a snare. Mathews¹⁹ recommends the dissection and snare method, making his incision before grasping the tonsil with a forcep. Colson²⁰ strongly recommends the suction tonsillectomy but states that it has the disadvantages of the Sluder in that it cannot be used in all instances. Dutrow²¹ believes the dissection and snare method to be the best because it is applicable in all cases. And so we could go on almost endlessly. Each one is convinced that his method is the very best. It is the best if it is scientifically correct and if it uniformly assures good results. To be scientifically correct it must

be based on sound surgical principles which respect anatomic structures. No instrument made can possibly have surgical judgment, nor can any one instrument be expected to remove a tonsil completely if we recall the variations in the size, shape and position of the tonsil and its relation to surrounding structures. Any method can be considered a good method if in the hands of the reasonably skilled surgeon:

1. The entire tonsil structure will be removed;
2. All other structures will remain uninjured;
3. After operation the throat will be symmetrical, and
4. If the method is simple, rapid and applicable in all cases to permit the operator to develop proficiency and thus give him a sense of security so necessary in surgery.

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Burbot Liver Oil As An Antirachitic

(Preliminary Study)

Thomas Myers, M. D.*

St. Paul, Minn.

THE valuable rôle played by cod liver oil as an antirachitic substance was discovered empirically by British and Scandinavian fishermen centuries before vitamin D was recognized as the specific factor. Its use in rickets was first reported by Schuette in 1824, although its specific value remained unrecognized for almost a century.

During the past decade considerable effort has been expended in developing preparations containing vitamin D in greater concentration than is exhibited by cod liver oil, thus increasing potency and palatability. Beginning with irradiated ergosterol, which offered an artificially prepared vitamin D, and extending down into halibut liver oil, as well as the oils from various other sea fish, numerous workers have labored to perfect concentrates which would provide both A and D vitamins of high potency in small bulk. Until very recently, oils of therapeutic value had been obtained only from fish of marine origin.

While most inland fish possess these vitamins in small amounts, it was not until 1922 that McCollum¹ demonstrated that the liver oil of the burbot, a fish commonly found in our northern lakes, exhibited antirachitic qualities of high order, as well as the power to over-

come xerophthalmia effectively. In 1922, Glow and Marlott² used burbot liver oil on rachitic rats, and concluded that it was eight times as effective as cod liver oil. In 1932, Nelson, Tolle and Jamieson³ investigating the burbot for the U. S. Bureau of Fisheries, stated that in experimental rickets, its liver oil was from three to four times as potent in vitamin D, and from four to ten times in vitamin A, as in good grades of cod liver oil.

The burbot, or lawyer fish (*Lota maculosa*), is the only fresh water relative of the cod, being found abundantly in the majority of the northern rivers and lakes of this continent. It occurs in New England, the Great Lakes region, north to the Arctic sea, and is also found in northern Europe and Siberia. It is assumed that the burbot, at one time a salt water fish, remained in the residual waters when the sea receded from the North American continent, and became adjusted to fresh water conditions. The burbot is found in enormous numbers in the Lake of the Woods, where it breeds prolifically, and is very destructive to game fish. It weighs about three pounds, ten per cent of which is represented by the liver. This yields from 30% to 60% of oil. The vitamin content of burbot liver oil has been assayed at 4500 units of vitamin A, and 640 units of vitamin D per gram, or about eight times greater than the requirements for cod liver oil as stated by the Council on Pharmacy and Chemistry of the American Medical Association.

The medicinal application of burbot liver oil finds its most useful place in the treatment and prevention of rickets. While the growth-stimulating, anti-infective and anti-xerophthalmic qualities of its vitamin A content are of considerable value, the tendency for rickets to occur in over 50% of infants in temperate climes, unless vitamin D is included in the diet very early in life, lends emphasis to the benefits associated with it in that connection. It is now considered an essential part of every infant's regimen to add an ample amount of vitamin D after the first month. Human and cow's milk have been demonstrated as insufficient protection against rickets. Egg yolk possesses a small and varying amount of this factor. Assimilation and storage of calcium and phosphorus cannot be adequately performed unless additional vitamin D is provided, and the delicate balance between these elements is easily upset in infancy unless this stabilizing factor is added. Tonney⁴ has shown that growth, normal dentition, proper posture, and resistance to infection are all affected when vitamin D is lacking. Harris⁵ states that the most reliable



*Instructor in Pediatrics, University of Minnesota.



weapon in the treatment of rickets is vitamin D, as found in cod liver oil; exposure to sunshine is insufficient protection. Many observers have concluded that vitamin D is likewise necessary in older children and adults, for the purpose of promoting skeletal growth, preventing dental caries, and as a prophylactic during pregnancy, against maternal demineralization.

In order to test the rickets-preventing qualities of burbot liver oil, fifty infants at the age of one to two months were given oil in doses of ten minims once daily. In the cases of a few premature infants, or where clinical bone changes suggestive of developing rickets occurred, the dose was increased to ten minims twice a day. The infants were selected at random from those attending an infant welfare clinic, and came from families in very modest economic circumstances or receiving direct relief. In all cases, however, the infants made normal gains and developed satisfactorily while under observation, for periods varying between six months and one year. In no case did definite clinical rickets occur. Attempt was made to have an X-ray taken of a wrist in each case, but it was difficult to persuade the mothers to bring their infants to the X-ray laboratory in all cases. Fourteen of the completed group were X-rayed, and in none was rickets demonstrable. In this connection it may be worthwhile to refer to the statements of Shelling and Hopper⁶, and also Park and Eliot⁷ on the inadvisability of interpreting the usual clinical signs, such as thickening of epiphyses, cranio tabes, beading of the ribs, *etc.*, as pathognomonic of rickets unless the X-ray films are also positive. Park and Eliot state that the diagnosis of the early stage of rickets is often difficult, and that to differentiate between active and cured

rickets may be impossible without X-ray. The roentgen film is of more importance than calcium and phosphorus determinations in the blood serum, as normal levels are reached soon after treatment is begun. Such determinations were made on a few of the infants observed in this study, with normal findings. The accompanying X-rays are part of a series, all showing no indications of rickets.

Summary

1. Burbot liver oil has been presented as the first cod liver oil substitute to be made from fresh water fish. It possesses a potency approximately eight times that of cod liver oil.

2. In a small series of cases, burbot liver oil gave satisfactory anti-rachitic protection. While no definite conclusions should be drawn from so limited a study, the possibilities of this preparation are worthy of further investigation.

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The Name of the Doctor*

Arthur N. Collins, A. B., M. D., F. A. C. S.

Duluth, Minn.

MEMBERS of the Northern Minnesota Medical Association and Guests, Ladies and Gentlemen:

It is with deep gratitude that I appear before you on this occasion to acknowledge the high honor conferred upon me when you elected me your president. In taking my place in the list of honored physicians who have led the way for me as presiding officers in this vigorous organization, I cannot but feel a keen sense of pride and a feeling of warm friendship for all its members. It is my hope that the Northern Minnesota Medical Association will grow larger and broader each year; larger, in the sense of increasing yearly attendance, and broader, in that each member will come to know his practicing confreres better and to find himself in greater sympathy with them. It is this last sentiment which furnishes the keynote for my remarks.

In this day, it is no small blessing that we belong to a profession of such vast accomplishments and far-reaching beneficence. Were we responsible for all this ourselves there might be just cause for exultation. But it is an inheritance for the greater part. Most of the glory belongs to our predecessors. Our traditions have been woven from the finest fibre found in our professional forefathers. Medicine today is the product of the past and the foundation of the future.

In the past it was an infinitude of dogma and opinion. In the present it is beset by incursions of economic difficulties in bringing the best of present day scientific medicine to all classes of our people. In the future, medicine will be more and more scientific, but how much of the old will suffer disproof and be sloughed off from the curriculum of the past and of the present, remains to be seen. Certain it is, however, that the high ideals which have sprung from the fine characters of our predecessors will endure through the generations of physicians who will follow us. Atavism, or reversion to a former type, will indeed be far removed from a profession which has shown itself to be so virile and forward-looking as the medical profession. *Progress* in healing the sick is our tradition.

This great tradition, our dearest possession, is like a mighty tree grown straight. The younger generation is reared beneath it, the mature thrive in its environs and the old die with its stalwart form still in full view.

Every thinking physician realizes before he has practiced many years that this inheritance has come to him through no virtue of his own, and he may feel his unworthiness in having it thrust upon him. But he is powerless to ward it off and must accept it. It was created

for him by those who preceded him and it was presented to him by an invisible hand at the time he received his diploma. Progress must be his watchword.

Volumes have been written on the good deeds of the doctor. He hears it at banquets and in the church. He is reminded often that he has adopted an honorable profession. He begins to feel pride in it and he tries to merit the honor that goes with it.

Listen to Robert Louis Stevenson's Eulogy of the Doctor: "There are men and classes of men that stand above the common herd; the soldier, the sailor, the shepherd not infrequently, the artist rarely, rarelier still the clergyman, the physician almost as a rule. He is the flower of our civilization and when that stage of man is done with, only to be marvelled at in history he will be thought to have shared but little in the defects of the period and to have most notably exhibited the virtues of the race. Generosity he has, such as is possible only to those who practice an art and never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Herculean cheerfulness and courage. So it is, that he brings air and cheer into the sick room and often enough, though not so often as he desires, brings healing."

The name of the doctor is buoyed up and sustained by public opinion. He can maintain it thus, if he is faithful to his trust. His sincerity is his safeguard. He can make mistakes, as all men do, and be forgiven. He is human, and all his neighbors allow for that. He has his faults, as all have, but these are overlooked by a generous public. Surely no man could start his career with factors more in his favor, for the doctor has a good name.

But, how about his regard for his fellow practitioners? Does he admit they have ability equal to his own, or will he say that competition is keen and that reputations must suffer? Will he be tolerant of professional mistakes he might discover in others? Or will he call attention to such mistakes? Does he think, because Doctor Newman comes to practice in Pleasantville after Doctor Olderman, that he is the better physician? Was Tennyson, because he came after Shelley, therefore, the greater poet? Let us see, with such a concrete situation at hand, what befalls him.

The doctor finds himself at the crossroads. Which way shall he take? No power on earth could make him accuse a legitimate confrere, the maker of a mistake, as being a quack, a crook, a criminal or a scoundrel! But he might just suggest, partly to show his superior knowledge, partly from his position of security, that there was a mistake made. It is often difficult to decide

*Read before the Annual Session of the Northern Minnesota Medical Association, held at Fergus Falls, Minnesota, August 31-September 1, 1936. Presidential address.

at the crossroads. A malpractice suit might result from his words or from his attitude. If he could only remember at such a time what was said about doctors at the banquet and the pride he felt at that time! Was it meant for him only, or for other doctors, too, including the one who made the mistake?

While he is choosing his course in this critical moment, let us see what experience has taught in such matters. If a malpractice suit is started, he will no doubt be called upon to testify and if he "downs a competitor" in this way he may have temporary exaltation. But how can this endure in a man who has felt pride at the banquet-talk about doctors? Are his professional friends beginning to distrust him, or is this merely his imagination? Was that remark he may have overheard, indicative of distrust on the part of his patient? It might be imagination. But is the type of his work deteriorating? Doesn't he tend to work alone? Doesn't he know of another doctor in the same situation who became a "down and outer," an abortionist and a dealer in narcotics? The *name* of the doctor is what matters.

He has been watching the doctor who made the mistake. Both went to the same medical school and both received the same teaching. They are not friends now. That mistake and the lawsuit have fostered an inferiority complex in the "doctor of the mistake." He feels his confreres regard his work as of poor quality. He may feel they believe him guilty of wrong doing. The situation is so changed! He was once so cheerful and on such good terms with his fellow practitioners! Now he wonders whether the worry of medical practice is worth while. Unless helped and cheered by his confreres he may develop a mild form of melancholia reflecting detriment not only to himself but to his family and his entire professional following.

Each of the physicians, in an episode of this character, can with justification devoutly wish such a nightmare obliterated from the minds of all men, including themselves. It is not merely the name of doctor A or of doctor B which matters so much, but the name of the doctor in a larger sense, that name which belongs to all of us, which suffers, doctors warring against each other in the courts and before the public eye!

It would be in keeping with good sense to remind ourselves, from time to time, that whereas we rejoice in our ability to bring comfort and healing into the lives of our patients, we have also a solemn civil responsibility to them and to the public, and it behooves us to review for our own good this civil responsibility in some of its tenets which directly concern us. Every physician should possess in his library and keep ready at hand a volume on this subject. He should read it from time to time, and thoroughly digest its teachings. His civil responsibility in the conduct of his practice is indeed no minor matter.

Here are a few important phrases concerning the civil responsibility of the physician taken from a competent authority (Mitchell of Massachusetts): One who en-

gages to undertake the performance of any duty, trust or employment agrees to do it with honesty, skill and assiduity. Errors of omission are treated with greater leniency by the courts than errors of commission. Physicians and surgeons must use *ordinary care* regardless of whether they were compensated or not. The law in this country does not distinguish between physicians and surgeons.

Where the patient does not *co-operate* with his physician, thereby injuring himself by his own wilful or negligent conduct, he cannot hold the practitioner responsible for the results to which he contributed and it makes no difference whether or not the patient was prevented from following the physician's directions because of his condition. The burden of showing a want of the necessary *skill* must be proved at the trial by the patient in order to secure judgment against the physician. On the other hand the burden of proving contributory negligence is on the defendant.

The law says that where a person knows the dangers incidental to certain undertakings, he is, by law, deemed to have assumed the risk, and consequently cannot complain if injury results. From this it would seem that a physician and surgeon can forestall malpractice suits against himself by warning the patient of unpleasant possibilities and expressly stipulating with him that in such a contingency he shall not be answerable. It is always best to tell the patient that a perfect result is by no means certain.

It is well to emphasize the matter of care and skill; an erroneous diagnosis does not necessarily give a right of action to the injured party, but must have been the result of *negligence* or a want of skill on the part of the physician, though a wrong diagnosis followed by improper treatment is good ground for an action for malpractice.

The performance of a surgical operation on a patient whose consent has not been obtained will render the operator liable to damages to that person. The *patient* must be the final arbiter as to whether he shall take his chances with the operation, or take his chances living without it. Such is the natural right of the individual, which the law recognizes as a legal one. Consent, therefore, of an individual, must be either expressly or impliedly given before a surgeon has the right to operate.

During an operation already authorized, new conditions may be discovered or may develop in the most unexpected *manner* and in such emergency-cases the physician will be justified in performing an operation without any consent, if the operation is necessary and expedient. The burden of proving that the operation was not justified by consent of the proper person rests upon the plaintiff. The law will presume, until contrary proof has been adduced by the patient, that care and skill were used by the physician in his treatment and the burden of proof is upon the plaintiff to show that the physician was negligent or unskilful.

All our experiences are made up of two elements: first, the outward circumstance, and second, the inward in-

terpretation. Are we, at all times, competent to sit in judgment of the motives of our brother practitioners? Tolerance is born in some men, absent in others, and is difficult to cultivate by many. We should guard against self-complacency. We should seek new values in tolerance and co-operation. We are unselfish so far as our general group is concerned. The next step is to apply this quality individually and to stand up for our brother physician. We may not have fallen *below* the standards of our predecessors, but is it clear that we are above them in *clarity of vision* and *bigness of purpose*? Humanity has been on this planet many thousands of years. Our brain is apparently as large as that of the man of the ice ages. Is our soul no greater?

The doctor, if he prays at all, let him say: make me a competent guardian of the health of my patients and make me charitable toward any shortcomings of my fellow practitioner, even as he is charitable toward me, and should he stumble and fall, give me wisdom and courage to lend him a helping hand.

Then as we carry on in our work from day to day let us remember these sturdy lines from Robert Burns:

For a' that and a' that,
Their dignities, and a' that,
The pith o' sense and pride o' worth
Are higher rank than a' that.

The Use of the Vaginal Douche

In Clinical Gynecology

David W. Tovey, M. D., F. A. C. S.*
New York, N. Y.

THE selection of a suitable douche preparation is a matter of great concern to the clinician who treats a variety of cases of vaginal infections.

While it is true that many vaginal symptoms can only be cleared up by the removal of deep-seated causes, the therapeutic vaginal douche serves as an important adjuvant in the treatment of these cases; and in minor infections a surprising number of cases appear to be cured if the proper technic is used, and a suitable douche preparation is employed.

Two major problems confront the clinician in the selection of a douche preparation.

The first problem is to find one that has powerful antiseptic and cleansing properties when in contact with the vaginal mucosae and cervix. The solution must be potent enough so that a douche prescribed twice daily will prevent the development of bacterial infection and maintain the curative gains obtained from office treatment.

On the other hand the second problem is that the preparation used must not be harsh or irritating even if used in much stronger dilution than prescribed. With the recognized carelessness of so many patients in the matter of dosage,—as witness the numerous cases appearing for treatment with vaginal irritation or inflammation due to the use of caustic or toxic douches—the importance of this safety factor need hardly be emphasized.

In over a hundred cases in which I have used a douche preparation composed of boric acid, zinc sulphate (dry), salicylic acid, phenol, menthol, thymol, and eucalyptol,

*Clinical Professor of Gynecology and Obstetrics, New York Polyclinic Medical School and Hospital, Fellow American Association of Obstetricians, Gynecologists and Abdominal Surgeons.

good results have been obtained without a single case of burning or irritation. This combination is not only antiseptic, but it is soothing and healing. It readily dissolves thick tenacious mucus, and affords the patient a sense of cleanliness and well being which was commented on by all patients using it. The preparation gives markedly better results than any of the newer vaginal antiseptics such as sodium perborate preparations, etc., which have been so widely advertised lately.

Illustrative of the typical cases encountered in everyday practice are these case histories selected from those under consideration in this series:

Case 1—45 years old.

This patient has one child, and has had three miscarriages. She shows a negative Wassermann.

There is a six-year history of leukorrhea.

Upon examination, her cervix is eroded and enlarged, and exquisitely tender on both sides. The uterus is retroverted.

Cervicitis and salpingitis present.

Her treatment consisted in douches twice a day over a period of four weeks, during which several copper-ionization treatments were given. Great relief after four weeks.

Case 2—30 years old.

This patient complained of pain in the back, leukorrhea and constipation.

Menses started at twelve years, and were regular until two months ago.

Examination showed the vagina reddened and inflamed and the uterus enlarged; and smears when examined in the pathological laboratory showed trichomonads.

The diagnosis: pregnancy and trichomonas vaginalis.

A two weeks course of treatment consisting in douches twice a day relieved the discharge and afforded the patient perfect comfort.

A routine check-up after eight weeks showed no recurrence of the infection.

Case 3—39 years old.

The patient complained of a profuse discharge and severe burning and itching in the vagina.

Menses started at 12 years. Last menses four weeks ago flowed two weeks.

The patient had had no miscarriages and no child.

Upon examination the vagina appeared very inflamed, the uterus enlarged and retroverted, the cervix swollen and eroded.

Diagnosis was cervicitis, retroversion, metritis, vaginitis and gonorrhea.

The patient was under treatment for five months, during which time douches were used every day in addition to the causative treatment. The douches greatly relieved the burning and purulent discharge, and aided in the treatment of the gonorrhea, as well as affording the patient relief and comfort.

Case 4—42 years old.

Profuse vaginal discharge for over a year (since last menses) was complained of.

The patient had no child and has menopause symptoms.

Upon examination the vagina appeared inflamed, the cervix was not eroded. Pathological laboratory examination of smears showed no trichomonads, but colon bacilli and *Bacillus faecalis*.

Diagnosis: vaginitis and menopause.

Tepid douches every other day gave relief and stopped the discharge.

Case 5—21 years old.

This patient's history: menses at 13 years, with a history of difficulty at that time and a Caesarian section for placenta previa.

The uterus was adherent and posterior, the cervix small and eroded, the vagina inflamed.

Diagnosis was retroversion adherent, vaginitis and cervicitis.

Copper ionization therapy cleared up the cervical condition after eight treatments. Douches were used every day, and the cervicitis and vaginitis were relieved in three weeks.

Case 6—37 years old.

This patient complained of pain in the back, burning and itching in the vagina, with a profuse discharge.

Examination showed the cervix not eroded, retroversion adherent, the vagina and vulva inflamed.

Diagnosis; retroversion adherent, vaginitis with pruritus vulvae.

This patient was seen every week for a period of eight weeks, during which time a douche was used every other day. At the end of the eight weeks the patient was discharged, the symptoms of infection having disappeared.

Case 7—39 years old.

This patient had two children.

Menses at 11 years. She had had leukorrhea since the last baby, but no pain or particular discomfort.

Examination showed the cervix severely lacerated and eroded, with the vagina inflamed.

After diagnosis of cervicitis and vaginitis, the patient was treated with copper ionization, coupled with daily douches, which relieved the discharge after six weeks.

The patient was seen again two months after being discharged, and there was no vaginal inflammation or evidence of cervical infection.

* * * *

It was surprising to note the number of cases where this simple treatment resulted in curing chronic conditions where we had thought that the best that could be experienced would be symptomatic relief.

The technic used was to have the patient in the recumbent position with the douche bag at an elevation of approximately four feet. A gallon¹ of the solution was used, the dosage being eight teaspoonfuls to the gallon of warm water. After office treatment the patients were instructed to use this treatment twice a day, and report back at least once a week. A course of treatment of three to four weeks was found sufficient in most of the cases, and after this course of treatment the patient was warned against the use of a daily douche. It has been our experience that a great deal of harm is often done through the use of too frequent douches, and we have recommended the routine use of a douche not more than two times a week after the vaginal condition is normal.

Vaginitis, cervical erosions, cervicitis, and endocervicitis, pruritus vulvae, and leukorrhea responded to the treatment. Because it so readily dissolves thick tenacious mucus, this douche preparation is particularly valuable in preparing for vaginal operations, and pre- and post-partum treatment. I use it as a routine follow-up after cauterization and copper ionization therapy² in the treatment of cervical pathology. It seems to aid materially in promoting healing.

In the treatment of gonorrhea the regular use of warm douches of this preparation lessens materially the purulent discharge and gives the patient a sense of cleanliness and well being, in addition to providing relief from the itching and irritation. The patient should be cautioned to have the douche bag at a very low elevation to prevent upward spread of the infection.

In vulvitis where focal infection of the urethra, Skene's or Bartholin's glands is at fault, the douche will relieve the symptoms and prevent a spread of the infection while basic treatment is directed at the cause.

Jacoby³ reports success in the treatment of pruritus vulvae in which no definite etiologic cause is apparent, through the use of subcutaneous perivulvar alcohol injections.

The douche treatment of leukorrhea is naturally symptomatic. The exceptional solvent and cleansing

powers of this preparation of boric acid, zinc sulphate (dry), salicylic acid, phenol, menthol, thymol and eucalyptol, will loosen and remove even the thickest and most tenacious mucus plugs and strands. It is particularly valuable in treating leukorrhea because it thoroughly deodorizes and leaves the patient without self-consciousness. If, as it is said,¹ about seventy-five per cent of the gynecologist's patients visit him because of leukorrhea, it can readily be seen how important it is to provide symptomatic relief while treating the underlying cause.

It is interesting to note that in three cases of colitis, enemas of the solution diluted one teaspoonful to the quart not only provided relief from the pain and discomfort caused by the colitis, but seemed to exert a marked healing effect. I am carrying my observations in this direction further.

BOOK NOTICES

PHARMACEUTICAL CHEMISTRY

A Text-Book of Inorganic Pharmaceutical Chemistry, by CHARLES H. ROGERS, D.Sc. (Pharm.); 2nd edition, revised, heavy cloth, gold-stamped, 724 pages, 55 engravings; Philadelphia: Lea & Febiger, Inc.; 1936. Price, \$7.00.

The physician does not see many works on pharmaceutical chemistry after he leaves medical school. It were better that he did, for medicine is more and more appealing to the chemist for the solution of many problems which in other years seemed to demand surgical or medical treatment.

Dr. ROGERS, the newly-elected dean of the College of Pharmacy of the University of Minnesota, and professor of pharmaceutical chemistry, has done a thorough revision of his standard text. The 11th decennial revision of the *U. S. Pharmacopoeia* and the 6th revision of *The National Formulary*, both issued in June, 1936, demanded that many changes be made in all pharmaceutical texts. Dean ROGERS has altered the material on tests for identity, assays, pharmaceutical preparations, pharmacological actions, etc. The latest processes in commercial programs for producing chemical compounds are presented.

This is an excellent pharmaceutical chemistry text, not intended to replace any works on general chemistry; it is now thoroughly up-to-date. The general physician will find it very helpful to him: it will sharpen his perception, and add to his knowledge.

ENDOCRINE SYMPOSIUM

The Medical Clinics of North America. Volume 20, Number 2: St. Louis Number, September, 1936; 350 pages, 24 illustrations, grey cloth, gold-stamped; Philadelphia: The W. B. Saunders Company; 1936. Price, yearly issue from July 1936 to May 1937, paper, \$12.00; cloth, \$16.00.

This is the St. Louis number of the justly-famous *Medical Clinics*. It contains such treatises as CYRIL M. MACBRYDE's on *Borderline Endocrine Disturbances*, MAX DEUTCH's on *The Diagnosis and Treatment of Endocrine Infantilism*, HAROLD A. BULGER's *Endocrine Obesity*, and LOUIS F. AITKEN's *Diagnosis and Treatment of Hyperinsulinism*. DAVID P. BARR and KURT MANSBACHER have an article on *The Treatment of Pituitary Insufficiency and Hyperfunction*.

These clinics appear regularly in bound form, and are now too well-known to evoke extended comment. In most cases, the material contained in them is much in advance of similar work offered in current medical journals and books; and the treatment given the subjects by their authors is exhaustive. The book will be very valuable to the endocrinologist.

Summary

(1) The douche treatment of vaginal infections is valuable in clearing up a variety of chronic conditions, and as an adjuvant in the curative treatment of deep-seated vaginal infections.

(2) A preparation composed of boric acid, zinc sulphate (dry), salicylic acid, phenol, menthol, thymol and eucalyptol, provides for all practical purposes an ideal douche solution.

(3) In using the douche and prescribing for home treatment, emphasis should be placed on the use of at least a gallon of solution, and after the condition has responded to treatment, the patient should be warned against too frequent douching.

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BALYEAT ON ALLERGY

Allergic Diseases: Their Diagnosis and Treatment, by RAY M. BALYEAT, M.D.; 4th edition, 132 illustrations, 485 pages plus index, green pebbled cloth; Philadelphia: The F. A. Davis Company; 1936. Price, \$6.00.

The well-known allergist and head of the Balyeat Clinic in Oklahoma City presents here a revision of his standard text which appeared a number of years ago. Naturally, the more recent phases of allergy are given first attention. The use of iodized oil, for example, in cases of intractable asthma, is discussed at length; and the great advances made in the study of allergy in dermatology and gastroenterology are covered by BALYEAT rather carefully. As in the first and subsequent editions, there is a history of the subject itself; but it is not exhaustive. The index is good, and the illustrations are well-chosen.

NEW OBSTETRICS TEXT

A Textbook of Obstetrics, by EDWARD A. SCHUMANN, A.B., M.D.; first edition, 780 pages, and 581 illustrations on 497 figures; Philadelphia: The W. B. Saunders Company; 1936. Price, \$6.50.

This is strictly a text. By that is meant that few historical aspects of the subject are offered, and no unproved or untried theories are discussed. The volume does present, however, the anatomy of the female reproductive organs, a short description of the fertilization of the ovum, the growth of the fetus and its physiology. Section II concerns pregnancy; Section III is given over to the mechanism of labor; Section IV to obstetrical pathology; Section V to the pathology of labor; Section VI to the accidents of labor; and Section VII to operative obstetrics. It is a pleasure to behold the illustrations by OLIVE STONER and A. L. COMRIE.

Professor SCHUMANN has produced an excellent short obstetrics textbook, which it is a pleasure to recommend. Its modest cost is a surprise.

A BEAUTIFUL MEDICINE BOOK

The Practice of Medicine, by JONATHAN CAMPBELL MEAKINS, M.D., LL.D.; 1st edition, red cloth, gold-stamped, 1,310 pages plus index, 505 illustrations, of which 35 are in color; Saint Louis, Missouri: The C. V. Mosby Company; 1936. Price, \$10.00.

This is a volume which it is a delight to recommend. It is outstanding in every way; but particularly so in the manner in which the author has chosen to use the pictorial method of enlightenment. This is a book primarily intended for the general practitioner and the medical student; and the specialist is therefore slighted in the interests of more extended inclusion in the field of general medicine. This is admirable. Enough texts have been written for the specialist; too many "medicine" books, in fact, have leaned heavily toward the favored specialty of the author concerned.

The author is professor and director of the department of medicine of McGill University in Montreal, Canada.

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THE INCREASING SCOPE OF ALLERGY

Few discoveries in biology have had a greater influence upon clinical medicine than the phenomena of anaphylaxis. Following closely upon this discovery at the turn of the present century astute observers began to explain on this basis certain maladies to which the human race has long been subject and for which no satisfactory relief measures had yet been devised. MELTZER in 1910 called attention to the similarity of anaphylactic shock induced in guinea pigs and the paroxysm of bronchial asthma occurring in human beings. KOESSLER independently of MELTZER concurrently made a similar observation and in 1913 reported a case of asthma caused by hypersusceptibility to hen's eggs. Although subsequent investigations have uncovered technical differences in the mechanism of allergic manifestations of human beings and anaphylactic shock experimentally induced in guinea pigs, it must be admitted that they are at least very similar. Notwithstanding the technical differences involved, allergy in human beings depends as does anaphylaxis upon the development of a peculiar hypersensitiveness to foreign substances. Whereas anaphylaxis in animals is experimentally induced only with foreign proteins, allergic shock in human beings occurs with protein and non-protein substances.

With proof of the allergic basis of true bronchial asthma, investigators soon reported other conditions due to hypersensitiveness. Hay fever, eczema, urticaria,

angioneurotic edema, vasomotor rhinitis, migraine, certain forms of dermatitis, and certain gastro-intestinal reactions seem definitely established as syndromes of allergy. The scope is constantly increasing and the careful clinician is finding it necessary to consider it in determining the etiology of an ever increasing number of conditions. It is perhaps proper to consider the possibility of allergic reaction in all the organs and tissues of the body. When no other obvious cause can be demonstrated and particularly if the altered physiology is of the functional type, it is not unreasonable to seek the etiology in hypersensitiveness to some foreign agent. The discovery of the substance responsible for the clinical manifestation often taxes the ingenuity of the medical observer to the utmost, but in the main such labor as it involves is properly rewarded.

R. V. ELLIS, M. D.

THE WHOLE PICTURE

A recent clinical experience re-emphasizes the need of the broadest possible base of general knowledge; also that intimate familiarity with a limited field may make the observer a very valuable agent in uncovering difficult diagnoses. However, both the experienced general observers and the highly trained technical experts must apply their respective "high power" faculties only after utilizing every possible "low power" estimate.

This is the experience: A highly strung rheumatoid arthritic woman died after six years of complaint, pro-

longed bouts of fever with moderate sweats, a period of an exaggerated skin reaction (variously diagnosed); an almost complete remission of the "arthritis" leaving a few small joints moderately spindled but not stiff; a terminal illness with high fever, prostration, marked leukocytosis and a myelogenous leukaemic blood picture. At various times she looked like the picture of subacute bacterial endocarditis despite successive negative blood cultures; and both early and late, as well as at postmortem, she *did not* have an enlarged spleen.

The immediate autopsy opinion was "myelogenous leukemia, with areas of leukaemic infiltration, liver, kidney, *etc.*" However, when these infiltrations were subjected to the closest scrutiny and the literature is carefully reviewed, they are found to be pyaemic abscesses, with certain small vessels plugged with masses of staphylococci. More complete blood and marrow studies place their respective reactions in the category of "a leukaemoid reaction." This was apparently an allergic reaction in a woman strongly sensitized; and probably against a bacterial antigen. The patient was probably right: "Everything I ever got in the way of 'shots' (and she had not a few) made me worse; it caused my skin trouble," she alleged. The clinical lead of subacute bacterial endocarditis was also close to correct. So-called periarteritis nodosa,¹ and related infections in blood vessel walls (arteritis)² are certainly near akin to that more common entity that dislodges emboli to infarct various organs and areas.

This sequence is briefly recited to emphasize the need of holding to whole picture in focus, rather than by inviting distortion by too intimate a view of any of its parts. He who looks must ever "tune in" by vigilant reading of current literature.

E. L. T.

Noteworthy Articles

1. Spiegel, Rose: "Clinical Aspects of Periarteritis Nodosa." *Arch. of Int. Med.*, Vol. 58 (Dec.) 1936, p. 993.

2. Wegener, H. (Breslau): "Über Generalisierte Septische Gefas Erkrankungen." *Verhandlung Der Pathologischen Gesellschaft (Gustaf Fischer)*, Jena 1937, p. 202.

READING WITH EMPHASIS

Some people mark up the books they read, often underlining sentences and bracketing entire paragraphs. Destructive vandalism we say with one accord. But wait a minute: whose books are we talking about? If they belong to a library or some other person, that's one thing, and we still agree; but if they belong to the reader, that's quite another matter. Is there any better way of expressing approval or disapproval of the written word than by making just such notations of acceptance or rejection at the very time; and what else in heaven's name are book margins for?

We know an OSLER of early vintage with pencilings all over the landscape depicting additional observations made by the great teacher on his hospital rounds the very day they were jotted down. Don't try to tell the owner of that book that it is disfigured. Not only does it have the added information but a wealth of inspirational value. It brings back the circumstances of the

case, the very ward in which the patient lay, the charm of the master as he patted a shoulder here and took the arm of another there in conducting his group of students from one bed to another. That book is illumined with precious memories. It is wear and all these little indications of use that testify to a book's worth and often enhance its value.

A. E. H.

HEALTH AT FLANDREAU INDIAN SCHOOL

The Flandreau Indian Vocational High School located at Flandreau, South Dakota, had its origin in 1872. It was then known as the Riggs School, named after the missionary who established it. In the early days of this school, the teaching was done by the use of charts and pictures in an attempt to interest the students in their work. There were no formal grades; in fact, it was not until 1898 that the first class graduated from the ninth grade. At present this school has approximately four hundred and fifty Indian girls and boys enrolled, and there are nearly sixty persons on the teaching and maintenance staff. Approximately one hundred students are graduated each year. The present superintendent, BYRON J. BROPHY, is a true educator and he has been influential in bringing about many of the modern activities on the campus.

In company with the physician in charge of health work, one is especially impressed with his knowledge of the health of each student. He knows the students by their first names and manifests a most unusual personal interest in them. He has their confidence; he not only teaches some of their courses but is available for numerous personal interviews. This physician is Dr. A. S. RIDER, who carries on a large general practice, including much major surgery, in Flandreau. For thirty years he has devoted a great deal of time to the Indian school and at present through his efforts the health conditions on the campus closely approach the ideal. Every student has been vaccinated against smallpox; they have all been immunized against diphtheria and typhoid fever; every student has had the tuberculin test, and all positive reactors have had X-ray films made of their chests. Dr. RIDER has detected a number of cases of clinical tuberculosis by this method before significant symptoms were present. All with acute illness, injuries, *etc.*, are immediately admitted to the campus hospital, where Dr. RIDER with a staff of nurses and technicians provide immediate and excellent care. Through his wide experience of thirty years in this work, Dr. RIDER has become expert on special health problems among the Indians. Every physician who happens to be in or pass near Flandreau, South Dakota, should visit this institution, not only to see the fine educational work that is being provided for the Indian youth and their response and appreciation, but also the unique health activities which Dr. RIDER has developed for them.

J. A. M.

SOCIETIES

PROCEEDINGS

MINNESOTA ACADEMY OF MEDICINE

Meeting of December 9, 1936

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 9th, 1936. The meeting was called to order by the President, Dr. Thomas S. Roberts, at 8 p. m.

There were 47 members and one guest present.

Minutes of the November meeting were read and approved.

The Secretary read a letter of resignation from Dr. John T. Rogers, a past President of the Academy. The Secretary stated that the Executive Committee had voted and recommended to the Academy that Dr. Rogers' name be placed on the Honorary Membership list. This recommendation was passed unanimously.

The following officers were elected for 1937:

President—Dr. E. M. Jones, St. Paul.

Vice-President—Dr. R. T. LaVake, Minneapolis.

Secretary-Treasurer—Dr. Albert Schulze, St. Paul.

Dr. Roberts asked the newly-elected President to take the Chair, and Dr. Jones expressed his appreciation of the honor accorded him in this election.

The scientific program followed.

EPISCLERITIS AND ITS RELATION TO DISEASE OF THE FEMALE PELVIC ORGANS

By

WILLIAM L. BENEDICT, M.D.

Section on Ophthalmology, The Mayo Clinic
Rochester, Minn.

Dr. Benedict read his Inaugural Thesis on the above subject.

Abstract

Episcleritis and scleritis appear in various form as acute, intermittent or chronic affections of one or both eyes. The disease attacks only adult persons and is more common in women than in men. The superficial forms and some of the intermittent forms of the disease are not harmful to sight even though they persist over many years. The deeper forms of the disease affecting the sclera and uvea lead to permanent changes in the coats of the eyeball. Some forms are very painful during the stage of inflammation. Repeated attacks of scleritis lead to thinning of the sclera, the appearance of slate-colored areas in the anterior sclera where inflammatory nodules have been situated, staphylomata in the ciliary zone, and sclerosing keratitis. Through changes in the uvea, the lens and vitreous become cloudy and in some cases secondary glaucoma leads to blindness.

The etiology of the disease has been attributed to tuberculosis, syphilis, gout, leprosy, focal infection, and disturbances of menstruation. It has long been known that episcleritis is associated with uterine disorders and is prone to occur in adult females who are subject to disturbed menstruation. Histopathologic studies have confirmed the diagnosis of tuberculosis in many eyes enucleated because of grave effects of severe scleritis. Some oculists have stated that nearly all cases of episcleritis and all cases of nodular scleritis are due to tuberculosis, but neither pathologic examination nor clinical experience offers adequate confirmation of this assumption.

Studies of a series of cases of scleritis in women in whom a relation between the attacks and disturbances of menstruation could be established showed that the cervix and uterus were foci of infection. Bacteriologic studies revealed a green-

producing streptococcus as the offending organism in all cases.

In cases where this relationship could be established, attempts to correct the uterine disorder were made. In some cases the cervix was cauterized; in others, hysterectomy was done. Improvement in the eye condition invariably followed operation. Recurrences were rare and in most instances mild.

Discussion

DR. FRANK BURCH, St. Paul: I am sure I speak not only for the ophthalmological group of this Academy but for all the members in welcoming Dr. Benedict into the organization, and also thanking him for again emphasizing the relation of eye diseases to general diseases. Dr. Benedict has made a real contribution along several different lines establishing such relationships, particularly the relation of prostatitis to iritis. In this thesis he has added to the fact that episcleritis is not only more prevalent in women, but that it has a definite cause in pelvic infections. Most of us do not see cases of episcleritis frequently. In other intraocular inflammations, as well as in episcleritis, we are beginning to learn in our studies of their etiology that we sometimes have to go far afield in order to direct the proper treatment. Practically all of our treatment heretofore was local, aided by non-specific vaccines, foreign protein therapy, etc. From my own experience, where this relationship of episcleritis with pelvic infection has been established, I have not been able to get any results from vaccines. Patients were improved or cured when referred to the gynecologist and received proper treatment. I believe Dr. Benedict's thesis is an important contribution and that he has established a rational basis for treatment of episcleritis.

DR. C. N. SPRATT, Minneapolis: Dr. Benedict has not mentioned the names of two men who have done considerable work on the etiology of scleritis. Both of these, Verhoeff and Stock, came to the conclusion that it was a form of tuberculosis. While I was house officer under the former at the Massachusetts Eye and Ear Infirmary, and at Freiberg, where I have seen the work of the latter, I was much impressed with their findings. Verhoeff had done considerable microscopic work and in addition to this Stock had injected the ear vein of rabbits with cultures of tubercle bacilli and had found that lesions of the choroid, uvea and sclera had followed which were very similar to conditions observed in humans. In 1911, I reported a series of cases of scleritis treated with tuberculin before the Minnesota Medical Society. All of these had been given, previous to treatment, a focal, general and local reaction to tuberculin. All of these patients recovered. Some time after this a patient under tuberculin treatment had a lighting-up of a pulmonary condition, and since then I have discontinued its use in all cases. Verhoeff likewise has discontinued the use of tuberculin and relies entirely upon hygienic measures.

I rely entirely upon the application of the Shahan thermophore in the treatment of these cases. One application of this instrument at a temperature of 145° F. for one minute has been followed by cure within ten days to two weeks. This temperature causes no permanent damage to the tissues of the eye. Recurrences do occur in a few cases and it would not seem that hysterectomy would be called for. Vaccines and foreign protein therapy have not been employed in any cases under observation.

DR. BENEDICT, in closing: One can not consider the diseases of scleritis and episcleritis without recognizing several different forms of the disease. Some individuals who are neurotic in temperament have a mild episcleral injection, sometimes diagnosed as conjunctivitis, which lasts for a few days and then disappears. That condition is known as episcleritis fugax. It probably is not due to infection. It has been assumed that it is due to some endocrine disturbance. We have no pathological proof of this. There is also an episcleritis which involves only the superficial tissues of the eye and occurs in the menstrual periods. It is noted in the textbooks of Weeks, Fox, de Schweinitz and others. Exacerbations have been noted at menstrual periods or at missed menstrual periods and are interpreted as vicarious menstruation. The etiology of tuberculosis has been brought into the discussion. Some years ago Dr. Knight and I

reported on two eyes which had been removed. In those two patients there was no clinical evidence of tuberculosis but the pathological picture was that of tuberculosis. We know only too well that the pathological appearance of tuberculosis is mixed so much with the pathological appearance of local granulomas and some systemic diseases that it is difficult for the pathologist to distinguish a difference.

Whether the uveal tract is involved secondarily or whether it is a coincident infection with lesions in the sclera has given rise to considerable discussion. As I said in my paper, it is not clearly established whether this is a single infection which is transmitted to the uveal tract or whether it is a separate infection. The lesions in the eye are histologically similar to tuberculosis and frequently attributed to focal infection, and our studies have shown that a green-producing streptococcus will produce such a lesion. We have been unable to find any bacterium aside from streptococcus which would produce such a lesion.

I have at hand case histories collected during the past 20 years—37 cases in all—in which amputation of the cervix or hysterectomy was performed. In no case was hysterectomy performed only because of infection in the eye itself; but where there was evidence of uterine infection. The infection in the sclera usually disappeared within three days from the time the operation was performed and it never recurred.

I have used the thermophore for its local effect to reduce inflammation in the eye. At temperatures of 140° to 160° the thermophore is kept in contact with the sclerotic nodule long enough to produce local reaction without necrosis. After a few days the inflammatory lesion will disappear, but that is by no means a cure. So long as the source of the disturbance has not been removed there is no question but what recurrences will take place, though at irregular intervals.

Peculiarly enough, our clinical observation has shown that all through the child-bearing period there may be no evidence of scleritis, particularly during the periods of pregnancy and lactation.

It is impossible to conceive of episcleritis as being a local disease of the eye. Simply to treat the local disease (and there are many ways of getting rid of the local reaction) has absolutely no influence on the cause of the disease; and to assume that getting rid of the local lesion in any way gets rid of the crigin of the disease is to blind one's self to the facts. Episcleritis is evidence of disease somewhere else in the body. The clinical observation that inflammation of the eye subsided after the removal of an infected uterus led us to believe that here was a source of infection that was just as potent as infection of the teeth. Cultures of teeth, tonsils and pelvic organs (uterus in women and prostate in men) always gave us the same type of streptococcus. Therefore, we had reason to believe that if a woman had recurrent attacks of episcleritis and if there was no question about the virulence of streptococci in the pelvic organs, we were justified in removing the uterus.

AGRANULOCYTOSIS

By

ALFRED HOFF, M.D.

St. Paul

Dr. Alfred Hoff, of St. Paul, read a paper on the above subject. Slides and charts were shown and cases reported.

Abstract

In 1922, Werner Schultz described a highly fatal syndrome which he regarded as a new and distinct clinical entity and for which he proposed the term "Agranulocytosis." Subsequent terminology by various writers included Agranulocytic Angina, Idiopathic Neutropenia, Malignant Neutropenia, and Primary Granulocytopenia.

It occurred mostly in elderly women and was characterized by necrotizing lesions in the mouth, pharynx, rectum and vagina, and was associated with fever, marked prostration and a profound leucopenia with complete or near complete absence of granulocytes in the circulating blood, but with little, if any, anemia or reduction in the blood platelets.

Since then much discussion has arisen as to whether or not it really constituted a new or a distinct clinical entity.

Surveys of the medical literature by numerous writers—among whom especially to be mentioned are Thomas Fitz-Hugh, Jr., and Roberts and Kracke—indicate that prior to his original description there were only three reports which at the present time would be classified as agranulocytosis: (1) by Brown in 1902, "A Fatal Case of Acute Primary Pharyngitis with Extreme Leukopenia"; (2) one by Schwartz in 1904, "A Case of Extreme Leukopenia"; and (3) one by Tuerck in 1907, "Septic Disease with Atrophy of the Entire Granulocytic System."

According to Fitz-Hugh, Brown believed that his case was identical with those of Phlegmon of the Pharynx reported by Senator in 1888.

Kracke and Parker stated that "it was responsible for more than 1500 deaths in the United States alone in the three-year period ending in 1934." They give a comprehensive review of the literature in an excellent article appearing in the Journal of the American Medical Association (Sept. 21, 1935) entitled "The Relationship of Drug Therapy to Agranulocytosis." The salient features in the etiological approach were summarized and the accumulative evidence incriminating amidopyrine as a causative factor given.

Leucopenia and granulopenia are frequent accompaniments of many diseased states, such as the leucopenic phase of an acute leukemia, pernicious anemia, aplastic anemia and certain infectious diseases such as typhoid and typhus fever, *et cetera*. However, in these the clinical features may be and often are distinctive and serve to make diagnosis possible.

Fitz-Hugh and Krumbhaar in 1932 reported the pathological changes found in the bone marrow in three fatal cases and stated that the marrow of the bones examined in one case contained active hemopoietic areas filled with myelocytes, promyelocytes and myeloblasts, while the peripheral blood contained only 200 w.b.c. per cu. m.m. In the other two cases there was likewise absence of myeloid aplasia. They suggested a condition of maturation arrest as an explanation for the paucity of the circulating granulocytes.

Henry Jackson, Jr., in a recent article, agrees with this viewpoint and in addition to 27 of his own cases coming to autopsy cites 11 cases analyzed by Custer in which "there are marked proliferation of the myeloblasts with failure of these cells to mature, while the other elements of the bone marrow were undisturbed."

Therefore, neither marked anemia nor thrombopenia are features of this disease. If one permits a severe anemia or hemorrhages in the skin to enter into the clinical picture, the diagnosis of agranulocytosis becomes hopelessly confused with other types of bone marrow insufficiency and especially with the acute phase of aleukemic leukemia whose symptoms in every other respect may be identical.

The present concept of agranulocytosis holds that it is due to a depressed condition of the bone marrow in which a selective failure of the myelocytic function occurs, causing a complete or a near complete disappearance of the granulocytes in the blood stream. The granulocytes protect the body against bacterial invasion and with their disappearance active immunity is lost and local bacterial invasion takes place in the form of necrotic lesions in the mouth, pharynx and rectum. General septic invasion results unless timely granulocytic recovery takes place. However, general sepsis may be so abrupt as to preclude the possibility of timely granulocytic response, thus resulting in the acute fulminant type with an invariably fatal outcome.

Four cases were presented with one recovery and three deaths. Autopsy was obtained in one case.

Slides were presented, showing the course, with frequent w.b.c. and differential counts, as well as more infrequent r.b.c. counts and Hb. determinations and the treatment employed.

Two cases followed the regular prolonged use of allonal. One case that died was in the hospital for a different ailment and developed an acute fulminant agranulocytosis after the daily use of two allonal tablets for 31 days. One case followed the use of dinitrophenol.

Allonal, according to its manufacturers, is allylisopropylbarbituric acid chemically fused with amidopyrine in the pro-

portion of 1:1.2/3. It enjoys considerable popularity as a pain-relieving and sleep-inducing drug, both among physicians and the laity, and in consequence is extensively used. Ordinarily it may be administered with unquestioned safety. I had one patient who took two, sometimes three, tablets every night for four years without demonstrable injury. But the accumulated evidence against amidopyrine-containing drugs is such as to warrant the statement that its prolonged use in the occasional sensitized individual may result in agranulocytosis and death. There is no exact method for accurately determining such sensitivity and, as a result, where its use is unduly prolonged it becomes necessary to check up such patients with frequent total and differential white blood cell counts for evidence of leucopenia and granulopenia and also to exert our best efforts to prevent its indiscriminate use among the laity.

Discussion

Dr. C. E. CONNOR, St. Paul: Our present interest in this entity dates from 1922, when Schultz described it as we have it today. Dr. Pepper, of the University of Pennsylvania, recently gave an historical résumé in which he mentioned the fact that MacKenzie in 1880 referred to Gubler as having first described agranulocytosis in 1857; Trousseau, in 1865, differentiated it from other anginas. Pepper thought they were describing what we know today as agranulocytosis; if so, the disease was lost sight of until Schultz brought it to our attention again.

The differential diagnosis from other types of malignant neutropenia, particularly acute leukemia, Vincent's angina, acute streptococcal sore throat and diphtheria, depends largely on laboratory methods, especially the differential blood counts and smears and cultures of the throat. There is nothing pathognomonic about the local lesion.

Dr. HOFF, in closing: This disease seems to be more of a private hospital disease than a city hospital disease. In a service of about 25 years at the Ancker Hospital I cannot recall ever having seen a case of agranulocytosis in that hospital. Possibly public hospital patients do not indulge in prolonged self-medication with the drugs of this group. Allonal is being used a great deal and this possibility of doing damage should be recognized.

* * *

The meeting adjourned.

R. T. LAVAKE, *Secretary*.

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting November 12, 1936

President, Dr. Donald McCarthy, in the Chair
COLON STREPTOCOCCUS MENINGITIS FOLLOW-
ING COLON RESECTION

JAMES KERR ANDERSON, M.D., F.A.C.S.

WALTER A. FANSLER, M.D., F.A.C.S.

Patient—Married, female, aged 63, referred by Dr. E. J. Hill, first seen June, 1936.

Complaint—For the past two months has had a peculiar aching feeling in the rectum, which has been gradually getting worse. Slight bleeding has been noted on several occasions but has always occurred after a constipated movement. No diarrhea, mucus or change in the bowel habit. She had noted a difficulty in completely emptying the bowel and would have to return to the toilet to complete the act. Slight returnable protrusion from the anus for the past few weeks.

Family History—Negative.

Past History—Childhood diseases only. Three full term pregnancies, otherwise negative.

Physical Examination—Essentially negative except for the rectum, and a soft systolic blow at the apex. Carcinoma of the rectum, just above the ano-rectal junction involving one-fourth of the circumference. Neither inguinal nodes or liver palpable.

Laboratory—On admission to Northwestern Hospital, urine negative. Blood creatinine 2.01 mgm. per 100 c.c., urea nitrogen

22.42 mgm. per 100 c.c. Hemoglobin 75 per cent, red count 4,020,000; white count 7500. Wassermann negative.

Growth removed at operation graded two by Dr. Margaret Smith. The growth extended 4 cm. along the wall from the ano-rectal junction and involved about one-quarter of the circumference. No glands demonstrated in specimen. Growth ulcerated and edges undermined.

Operation—June 19, 1936, under gas-ether anesthesia, one stage abdominal-perineal procedure. Midline colostomy. No metastases demonstrated at operation. The coccyx was not removed as part of the posterior procedure. Patient left the table in fair condition. Glucose râles was given intravenously during the latter part of the procedure.

Postoperative Course

Whole blood transfusion, citrate method, the afternoon of surgery. Rather stormy postoperative course for four days. Blood pressure remained well over 100 systolic, temperature at times to 104° F. and continuously above 99° F. Pulse to 120, respirations 20-30. Slight abdominal distention controlled with nasal suction. Some coarse râles in the right upper lobe which persisted. No cough or sputum. Given oxygen therapy for three days.

The fifth day postoperatively the temperature started down and varied from 99° F. to 102° F. for the next 16 days, never to normal. During this interval the pulse was about 90 and the respirations remained at 20. The colostomy was viable and functioned on the fourth day, the posterior wound pack was removed on the fourth day which may account for the slight drop in the temperature at that time. Irrigations were started in the posterior wound and carried out twice daily. There was no evidence of more than ordinary infection in the posterior wound at any time and the granulating surface appeared healthy.

During this interval the patient complained of feeling quite tired, weak and exhausted, but there were no findings except those mentioned in the chest and operative fields. A generous diet and supportive therapy were carried out. The appetite at all times was poor. The patient was catheterized for one week, then able to void. She made slow progress for 15 days, the chest condition did not clear up and the posterior wound caused her much discomfort. The anterior wound healed nicely about the stoma.

During the extremely hot spell in July (1936) when the outside temperature was 110, exactly three weeks after her surgery, her temperature suddenly in the afternoon rose to 106° F. and pulse to 120. Her condition appeared unchanged and she did not offer any new complaints. She was given general therapy for the lowering of temperature, including fans, ice packs and later an electric cooling unit, by which the room temperature was lowered to 70° F. Her temperature remained elevated and she became irrational at times, but when rational did not offer any particular complaints. During the periods of irrationalism she had involuntary urination. The chest findings had not changed nor increased, the white count the day following this temperature rise was 8,800 and the following day, 11,400. The temperature varied from 103° F. and 105° F., the pulse between 110 and 120, and the respirations between 20 and 30, until the day before exitus when they were 40. The urine showed some pus and red cells but less than on previous examinations, during the period of catheterization.

The above condition persisted for six days. Owing to the fact that nothing definite could be found to account for this sudden rise in temperature and the hospitals in the city were crowded with cases of heat prostration and exhaustion, it was felt that she was suffering from the heat. Fluids were given under the skin and by nasal tube as she would not take sufficient quantity by mouth. The periods of irrationalism increased in length and now when rational she complained of being unable to concentrate and that she could not see as well as previously. Four days after this temperature rise there were evidences of meningeal irritation, some stiffness of the neck and spasticity of the arms and hyperirritability, noted and reported by the nurse. Kernig's sign was positive the following

morning and spinal puncture was done, revealing a thick, creamy fluid which had to be aspirated, and which had a definite fecal odor. The laboratory examination of the aspirated fluid revealed a gram negative bacillus and a gram positive coccus in pairs and chains in great numbers. Dr. H. B. Hannah saw the patient in consultation but advised against a spinal lavage.

She expired about ten hours after the spinal puncture. The relatives would not consent to any sort of a post-mortem examination.

The question in this case is how the infection reached the meninges. The patient was not given a spinal anesthetic, which is the usual anesthetic in our cases, and the coccyx was not removed, which is usually done in order to give more room for the posterior dissection. She had a definite ether bronchitis with a possible low grade pneumonia. (Chest plates were not taken.) Blood cultures were not taken at any time. When the meninges were invaded is also questionable, possibly the day that the temperature rose to 106° F. and was thought to be due to the heat. Spinal puncture at this time might have revealed infection but to us was not indicated until 24 hours before death.

As we look back on the case possibly the stupor and the complaints relative to the eyes should have aroused suspicion of spinal irritation. Most likely the infection was blood born and accounts for her tired feeling and the inability for her to pick up strength. Possibly a blood culture would have aided us. After the meninges were invaded, of course, the course was rapid. A blood stream infection, which no doubt was present, may have been the result of some necrosis in the posterior wound, although drainage was adequate and the wound appeared healthy. The colon bacillus grows rapidly, overgrowing other organisms and could not have been present long, possibly six days.

This case is one of those in which the malignancy was completely removed with the gland-bearing area, with little difficulty and should have been one to add to the statistics of cured cases, had not this complication arisen.

In looking over the literature of meningitis caused by the colon group, practically all of the cases are in young children. The nose and throat specialists report cases following mastoidectomy but in most the portal of entry has not been determined. The disease is comparatively rare, in 1500 cases analyzed by Neal only seven cases were due to this organism and to 1925 there were only 44 cases in the literature. Barron, in a careful study of 42 cases of meningitis, 39 under three months of age, found 14 due to the colon bacillus. Tesdal reports a cure in one adult case. Ratcliff reports one case in 789 in Glasgow Royal Hospital due to the colon bacillus. He found the middle ear the most common focus. No recoveries were reported and treatment was of no avail.

LITERATURE

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FURTHER REPORT ON A CASE OF HYPERADRENALISM AND HYPERTENSION TREATED BY BILATERAL ADRENAL RESECTION

DR. S. R. MAXEINER

A year ago I reported before this organization a patient upon whom we did a unilateral adrenal resection for a very malignant hypertension, following the work of D'Corsay. At that time I told you that we were going to do the other side and would report subsequent progress.

In reviewing the literature, I found much written on adrenalism and hypertension, in fact, all of the phases of the disease of the adrenals, but there is one classification by Row-

tree¹ which I thought was interesting, to which we might refer briefly in which he classifies the diseases of the adrenal gland as follows:

"Hyperfunction:

Cortical (syndrome genitosurrenale), gives rise to:

1. Congenital pseudohermaphroditism.
2. Infantile pubertas praecox.
3. Adult virilism and hirsutism.

Medullary, may be associated with:

1. Neuroblastoma with multiple metastases to the liver and bones.
2. Benign ganglioneuroma.
3. Paraganglioma with intermittent paroxysmal hypertension or permanent hypertension.

Hypofunction:

Suprarenal insufficiency (hyposuprarenalism).
Addison's disease."

In looking through the literature I found a case similar to this one reported by Chazette² in an article from Paris, a woman 62 years of age who complained of palpitation, and breathlessness. Examination revealed her blood pressure to be 260/150. Subsequently she became worse, had some symptoms of cardiac failure and at that time her blood pressure was 320/190. This patient succumbed and autopsy revealed that the right suprarenal capsule weighed 7 grams and the left weighed 20 grams. In discussion, he states that death occurs within a few days and is characterized by a neo-formation of the suprarenal medulla without any tendency to become generalized. There is also a syndrome of suprarenal hyperfunction characterized by permanent hypertension with a tendency toward paroxysmal elevations.

This patient came to the Veterans' Hospital in 1933. He had attacks of pressure over his heart and a feeling as though it would stop, with pain in the left shoulder. This started before his discharge from the Army. In 1926 he was refused life insurance because of his heart and hypertension.

In 1933, pulse was 125 and regular, blood pressure 210/140, and electrocardiogram showed tachycardia with depression of the S. T. phase in derivation ii and iii. Urinalysis was negative and blood Wassermann was negative. Basal metabolic rate ranged from plus 10 to plus 29. Relative size of heart, 43 per cent.

- Diagnoses: (1) Hyperthyroidism.
(2) Hypertension.
(3) Tachycardia.

In February, 1933, a subtotal bilateral thyroidectomy was performed in which a total of 31 grams was removed. Microscopic diagnosis revealed a hyperplastic goiter intensively treated with Lugol's.

Fourteen months later he returned, complaining of symptoms similar to those in 1933. Pulse was 102 and radials were sclerosed. Examination of the eyes showed fundus findings of hypertension and marked change in the past year.

In 1935, heart and kidneys were in excellent condition. His basal metabolic rate ranged from plus 78 to plus 116. X-ray of the sella revealed the sella turcica to be slightly enlarged, 1.5 by 1.2 centimeters. Because the patient seemed to approach the suprarenal type of hypertension it was recommended that an attack be made upon the suprarenal glands and on April 3, 1935, the left suprarenal was resected through a kidney incision, approximately five-sixths of the gland being removed. The patient made a moderately stormy convalescence but his blood pressure promptly fell to 120 to 140 and remained stationary during the course of the next two or three months.

The pathologist's examination of the removed specimen revealed a gland weighing 7 grams with a bright yellow nodule, 8 millimeters in diameter imbedded in the substance of the gland. The nodule was made up of rounded and oval cortical type of adrenal cells. Diagnosis was, adenoma, cortical type, benign. Part of the periadrenal fat was studied for sympathetic fibers and were quickly demonstrated in abundance.

The patient was observed until June, 1936. His basal metabolism had dropped to normal following his operation and has never been above plus 10 since that time. His blood pres-

sure, however, gradually crept up to 210/150. Electrocardiogram showed increased depression of the S. T. phase. Eye grounds showed some edema but no hemorrhage.

On June 12, 1936, the other adrenal was resected, four-fifths of the gland being removed through a kidney incision. The amount of removed gland weighed 6.5 grams and revealed no pathologic changes. During operation the stellate sympathetic ganglion was uncovered and was resected.

Sixty days postoperatively the patient has shown a marked improvement in the S. T. phase, he feels clinically greatly improved, has gained weight and his symptoms of oppression, headache and pericardial distress have been almost entirely alleviated. The patient's blood pressure in December, 1936, is 160/110. Basal metabolism is minus 12 with a very great improvement in his clinical symptoms together with improvement in his electrocardiogram. This represents a fall up to this time of 110 millimeters in the systolic pressure.

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* * *

DR. THOMAS ZISKIN: (by invitation) This case presented some unusual features and, as Dr. Maxeiner stated, from the history—it does not seem to fit in with any specific class of hyperadrenal cases. We thought of a possible cortical tumor at first but it did not seem to fit in definitely with this condition as he had no signs or symptoms of hypervirilism. We thought of a medullary involvement of the adrenal but he did not have the paroxysmal type of hypertension usually found with this condition. Then again, there was the unusual feature of the extremely high B. M. R.

In looking over many of the cases reported in the literature I have found no case in which an extremely high B. M. R. is reported in these conditions. His B. M. R. was over 100 on several tests and after the first operation it came down to normal and has remained so ever since and is normal at present also while his hypertension has come back. It went back, as you noted on the chart, to 275 before the second operation and then came down again. His blood pressure taken today was 200/160, so you can see that it has come back some more since we last took it about two months ago, but the patient says he feels much better, the electrocardiograms taken at various times show the effect of the drop in blood pressure and even today the electrocardiogram looks much better than it did before the second operation or the first operation.

To go briefly into some of the theories as to why surgery may be indicated in these conditions we must go back to the first work of Crile. Crile started this work several years ago and first removed a portion of one adrenal. He found his results were not very good with this and then he started removing portions of both adrenals and did this for quite a while and then found his results here were also not as satisfactory as he wished them to be, and then he began to cut the splanchnics. This procedure was also used by Adson of Rochester who has done a considerable number of cases and who now sections portions of the splanchnic nerves together with resection of the adrenal glands.

Lately Crile has advanced another theory and has adopted a new method of procedure. In his studies in Africa on wild animals he reasoned that there should be a difference in the energy creating power of the various types of animals. He believed that the lion, which is a hyperkinetic, powerful animal, should have a comparatively larger sympathetic mechanism than the alligator which is a hypokinetic type, and studying these various types of animals and comparing them he proved that this theory was correct. He did find comparatively greater sympathetic plexes and ganglia in the animals of the type of the lion than he found in the alligator. As a result of these findings he is now cutting the celiac ganglion and removing also the aortic plexus, stripping the aorta of its nerve supply and he feels now that this is the operation of choice. He has operated on several cases, about 25 so far, and he claims that

the results are more promising than the previous operation of cutting the splanchnics together with resection of the adrenals. Crile believes it does not make much difference as to some of the factors in regard to the operation—he believes that good results can be obtained in older people and far advanced cases as well as in some of the younger people. Adson believes that the operation should not be performed in men over 45 years old or in patients where there has been marked arterial, cardiac or kidney changes.

There has been some work reported recently by Princemetal, Friedman and Wilson at the meeting of the American Heart Association in which they state there is no physiological evidence for the separation into organic and functional types of hypertension, or for the assumption that renal hypertension is due to vasomotor hypertonus and that surgical measures aiming at relief of high blood pressure by sympathectomy do not abolish the vascular hypertonus that is fundamentally responsible for hypertension. They experimented on patients with hypertension and say that increased blood flow in response to heat and reaction hyperemia were equal in degree in that of hypertensions and normals. They say that sympathetic vasodilation produced by the heat test produces no greater increase in blood flow in subjects with hypertension than in normals, suggesting that vascular tonus is not of vasomotor origin. Patients with coarctation of the aorta, however, showed a greater increase in blood flow in response to heat tests than do controls or patients with hypertension. This, to them, demonstrates that vasoconstriction of sympathetic origin is present in the upper extremities in coarctation of the aorta and affords indirect evidence that hypertonus in generalized hypertension is not of vasomotor origin. Anesthetized with procaine vasomotor nerves of the arm produce the same increase in blood flow in normal subjects and patients with hypertension, proving that vascular hypertonus is independent of vasomotor nerves and must be regarded as spasm of the blood vessels themselves.

Of course, this is somewhat different than the theories that we have been following in the study of these cases.

Another interesting piece of work was reported last week at the Central Society of Clinical Research in Chicago by Goldblatt. He produced persistent hypertension in dogs and in monkeys by partially clamping of the main renal arteries. He believes the ischemic kidney directly responsible for the formation or accumulation of an hypothetical substance in the kidney which causes this hypertension. Then, by removing the adrenals he was able to control this hypertension. He believes that this hypothetical pressor substance in some way sensitized the adrenal glands in the production of hypertension.

We see, therefore, that the subject of hypertension is still far from settled both as to etiology and treatment. The experimental work quoted would tend to show that the adrenal is a great factor in the production of hypertension but whether the surgical approach to the treatment of hypertension will finally be definitely established as of lasting value is still a mooted question.

DR. F. R. SEDGLEY: (by invitation) During the recent progress of this case my rôle has been chiefly that of an interested by-stander. Being unaware that my name was on the program I had expected to continue in that rôle this evening.

The case has been so thoroughly presented that anything I might say would necessarily have to be in the nature of a repetition. My thought about it at the moment is that we have a surgical and physiological experiment under way. On the theory of a relationship between the adrenals and hypertension, and in this case the added factor of an excessive metabolic rate, we have extensively resected both adrenal glands, which have been reported histologically normal.

To date the patient appears not only unharmed, but measured by his former symptoms of severe headaches, inability for sustained exertion, and a generalized debility, he seems clinically somewhat improved. Although his metabolic rate is about normal, his hypertension is still marked. Therefore, the outcome of this experiment will require considerably more time to arrive at its real significance, or value.

DR. E. T. BELL: This is an ordinary case of essential or primary hypertension. It is not hyperadrenalism. We have a well defined syndrome of hyperadrenalism which is due to a tumor of the adrenal medulla. This tumor produces paroxysmal hypertension by excessive secretion of the adrenalin. The disease may be cured by removal of the tumor. I have examined the adrenals from several hundred cases of primary hypertension and have never seen any anatomic changes in them.

After any major operation there is a period of a couple of months in which the blood pressure falls and the patient improves no matter what the operation is. Why that should be, I do not know. I once saw a patient with primary hypertension improve markedly for about two months after an operation for uterine myomas, but the blood pressure then returned to its previous high level. I do not think that the improvement in this case will be permanent.

DR. H. L. ULRICH: I just want to emphasize one or two items. The English have tried to correlate the diastolic pressure and manifestations of headaches in hypertension. Usually any pressure over 140 diastolic will give you a headache. Was there any study of this kind made in this patient? Cerebral spinal pressure will rise with the rise in diastolic pressures. In reference to the electrocardiogram, of course, a man who is having a blood pressure of 220 or 230 may show evidence of coronary insufficiency. We are still where we were twenty years ago—we do not know the case of essential hypertension. There is no question but that these people live on a different physiological level. I do not know that we ought to tamper with that physiological level. We can reduce their pressure—there are various other experimental things we can do to them. All we are studying, however, is their physiology, we are not explaining hypertension.

DR. NORMAN JOHNSON: I want to ask the X-ray men if any work has been done in an attempt to reproduce the surgical extirpation of the adrenals thru X-ray therapy. Is it possible to use the X-ray as a therapeutic measure for depressing the adrenals?

DR. MALCOLM HANSON: There has been quite a bit of work done as far as the X-ray treatment of hypertension is concerned. As in any specialty, X-ray has been used quite as a "cure-all" and there is no question but that there are certain people who have responded favorably to the X-ray treatments for hypertension but the impression you get from the literature is that the response has been very temporary.

DR. S. R. MAXEINER: I wish to thank the different discussors for the part they have taken. We presented this case because we had used all of our Staff members and called in outside consultants. Each one had made a thorough study of this individual and we thought it might be one of those cases which would respond to an attack on the adrenals. I wish to thank Doctors Thomas Ziskin, M. Nathanson, Frank Sedgley and other members of our Staff who were of assistance in the study of this patient.

I report this case, not to advocate this operation, but I feel this is a study group and these are the things we can discuss with profit to all of us.

CONTROVERSIAL ASPECTS OF THE TREATMENT OF CARCINOMA OF THE BREAST

(Abstract of a Presentation before the
Minneapolis Clinical Club)

By

ORWOOD J. CAMPBELL, M. D.

The speaker reviewed briefly the development of the present day radical amputation of the breast for carcinoma. It is his opinion that except for the work of Handley who demonstrated the pathway of metastases and the desirability of wide excision of fascia, no important advance in technic has been made since that developed by Halstead and Willy Meyer.

Surgeons differ in the amount of skin routinely removed. No definite rules can be laid down to determine the correct amount. The size of the tumor, its duration, and the presence or absence of skin attachment are factors which must be con-

sidered in determining the amount to be removed in any given case. Local recurrences may reasonably be charged to the operator so that in case of doubt he must elect to remove the larger amount of skin. In the vast majority of cases the skin flaps can be closed primarily.

The type of the incision is not important provided it observes certain fundamental principles. It should be planned to fit the patient and to observe the principle that the tumor must be in the center of the block of tissue removed. It should make provision for skin to cover the axilla completely and should be placed as low as compatible with an adequate exposure of the axilla.

The speaker believes that the practice of preserving the pectoral muscles is undesirable because of the added difficulty in obtaining exposure for a careful dissection of the axilla and because lymph born metastases have been demonstrated in pectoral fascia. The pectoralis minor may be stripped of its fascia and resutured to prevent scar tissue contracture about the axillary vessels.

Whether the operation should be performed by the use of the scalpel or the endothermic knife is a matter of personal preference. An incision made by the endotherm which does not encompass the limits of the disease gives no better chance of success than one made by sharp dissection. The speaker uses the endotherm rarely and then only for hemostasis of small bleeding points. It is never used in the axilla.

Because of the admittedly poor results obtained in cases involving axillary extension, there are those who would abandon radical amputation completely and confine the operation to simple removal of the breast. Such a philosophy of defeatism is unjustifiable. The radical amputation properly performed need be scarcely more deforming than simple amputation and when the axillary metastases are few and early, does yield an appreciable percentage of well patients who would otherwise succumb to the disease.

Rather than to abandon radical surgery, the speaker believes that the criteria of operability should be narrowed. Only earlier and more favorable cases should receive radical amputation. Even though they may be the only demonstrable metastases, extensive axillary involvement marks the case as one in which palliation is the only reasonable expectation and may be as successfully achieved by radiation alone.

Radiation is challenging surgery as the most effective therapeutic agent in early and operable cases. Particularly in England many competent men elect to use it in place of surgery. Unfortunately, comparative statistics are not yet available upon which to judge its efficacy. Small series have yielded results which if not quite as good, closely approximate the results obtained by radical amputation.

Because most carcinomas of the breast are radioresistant, interstitial radiation is more effective than surface radiation. With either the element or radon, a sterilizing dose can be given if the radiation is accurately placed with respect to the tumor tissue. The difficulty of localizing such tumor tissue in the breast and of irradiating the axillary nodes by the accurate approximation of radon or the element has been the greatest handicap to the method.

Surface radiation by high voltage roentgen therapy is properly an adjunct to interstitial radiation. Except in the case of the most radiosensitive types of tumors, such as acute inflammatory carcinoma, the speaker does not believe that X-ray radiation alone should be depended upon to control the lesion. Most radiologists prefer to use frequent small doses.

A sharp difference in opinion is registered with respect to the efficacy of postoperative radiation. The preponderate opinion as reflected in the literature favors its use. Comparative statistics show a 5 to 10% improvement over cases treated by surgery alone.

However, there are other series which fail to show this advantage and which have led to the opinion that postoperative radiation is without value. The speaker favors its use for those cases in which axillary metastases are demonstrated at operation.

Preoperative radiation is not extensively practiced as a routine procedure and yet is probably more reasonable than post-operative radiation. It should be used in all cases which approach the borderline of operability.

From the standpoint of curability, the speaker does not believe that an inoperable lesion can be converted into an operable one by radiation. However, many bulky carcinomas too large to be controlled by radiation can be devitalized and reduced in size to permit operative removal as a palliative procedure.

Surface radiation by X-ray is extremely useful in dealing with skin metastases and most valuable in controlling the pain of bone metastases. Under its influence, pathological fractures have been known to heal and to permit normal function and weight bearing.

The speaker concluded by expressing the feeling that the true picture of the curability of cancer rests somewhere between the contentions of the optimists and enthusiasts and those of the defeatists. The education of the laity is making itself felt in the higher percentage of early and operable lesions seen by the surgeon. Radiation shows more promise of further development than does surgery but at the present time in early and operable cases the radical amputation is still the better treatment.

DISCUSSION

DR. RUSSELL WRIGHT MORSE: I think that on a subject like this, one can best speak from personal experience rather than from statistics. The cases that come to us for treatment postoperatively, immediately after operation, represent a very unsatisfactory group for treatment, because we are faced with a serious problem. If we treat these cases mildly we may find that they will come back in a very short time with local recurrence. In order to actually eradicate cancerous tissue I think it is necessary to give a dose which is almost lethal to normal tissue and from which the normal tissue will recover with difficulty. I have not yet come to the point where I am willing to do this on every case routinely. If we produce this change in the soft tissues over the chest using 200,000 kilovolts with from one to two millimeters of copper filtration we are almost uniformly going to get a pleuritis and pneumonitis as a result of the X-ray. The patient recovers from this but has a period of disability from six to eight months in which there is discomfort and a sense of constriction in the chest. However, he does recover and I have never seen any late bad effect.

The group that comes back with recurrence locally is a much better group to treat because we know that we can eradicate any individual area of tumor in the chest wall in the majority of cases. Usually, the area which is treated remains free from malignancy afterward. I am not able to speak for the results which have been obtained with the higher voltage.

DR. MALCOLM HANSON: This has been a very interesting summary of this problem. I think cancer of the breast is one of the dark pages in medicine. Anything you can offer is well taken. To review the statistics for a long period of time it would be hard to evaluate some of these statistics. You should take into consideration the surgery, the type of surgery that is done, where the postoperative radiation is done and the type of radiation, how much is done and over what period, etc., before evaluating the value of radiation.

There is one thing I think you can evaluate from these statistics fairly reasonably now and that is that your results are about, I would say, 5% to 15% better in surgery followed by radiation or a combination of surgery and radiation. Personally, I believe that the combination of the two in the large series of carcinoma of the breast offer the best results at this time. There is one type that I think is definitely a radiation problem and that is the very sensitive tumor. Coutard gives these patients five test doses over a period of six to seven days, and will give them 200 roentgens per day. If it is a tumor that responds very rapidly that tumor is a radiation problem

and he says that the statistics from surgery on that type of tumor are very poor. I think in these cases it would be well to give them a preoperative dose of radiation, sort of a test dose,—if they do not respond, operate upon them around fourteen days after their radiation has started. At that time you can operate upon them without difficulty and then probably give them postoperative radiation.

As far as high voltage is concerned, I think we should have a larger number of cases and that these cases should be carried on for a longer period of time to determine exactly what the effect is in higher voltage. We also know that in many of these tumors it is necessary to give, for instance, nine to ten times the erethemia dose. We will have to wait to know ultimately to determine exactly what our effect is going to be with high voltage.

DR. J. M. HAYES: As Dr. Hanson has said the treatment of cancer of the breast has been one of the dark pages of medicine.

The comprehensive report of Dean Lewis presented before the American Surgical Association, gives us something serious to think about regarding this condition. His report covers a period of forty-three years and figuring the results by decades, the recent decades apparently do not show any great progress in our ultimate results.

The fact that more than 10% of these cases are living after a period of ten years does not speak well for the established methods of handling this condition. As Lewis has well shown, statistics must be figured from many angles in order to give us a definite knowledge as to what really are our end results. One may draw the conclusion from McNeally's report, on the local removal of the breast cancer, that this method gives results equal to those obtained by all other combined methods. The fact is that when the growth has once spread from the original site our chances of cure are not bright.

I once had an opportunity of examining several of these resected specimens in which the surgeon and pathologist reported no palpable glands outside of the original site. Studying these closely with a magnifying glass revealed many glands not much larger than the head of a pin, yet proved to be malignant. Our greatest difficulty is that we are not getting these cases early enough for cures. I have been especially interested in Harrington's report. It is, no doubt, from such a large number of cases well supervised that we get our most reliable statistics. His reports seem to substantiate the statement of Dean Lewis: "The very questionable effect of radiation." Lewis says, the inevitable fluctuation in the results of treatment of breast tumor is probably due to the type of neoplasm and the indeterminable extent of the disease. My observations, including my fifteen years of service in the outpatient department of the University Hospital have strengthened my belief in the above statements.

I recently reviewed twelve cases with metastatic lesions following radical removal of the breast cancer. Two were in the spine; one in the pelvis; three in the pleura; one on the cervical glands on the opposite side; two in glands on the same side; one beneath the scapula; one between the ribs beneath the site of the original lesion after prolonged treatment with X-ray and one in the ribs on the same side. Apparently earlier surgery alone would have headed off the disease in these cases.

The educational campaign has not yet accomplished what was expected of it in getting these patients in for early treatment.

DR. E. T. BELL: A paper by Nathanson and Welch in the *American Journal of Cancer*; 1936, Vol. 28, page 40, gives a follow-up study of 150 cases of cancer of the breast from several Boston Hospitals. The patients were treated chiefly by surgery, but many had X-ray treatment also. The authors show a survival curve rather than five-year cures. About 33% survived 5 years; 22%, 7 years; 11%, 10 years; and 6% for 13 years. Nearly all of the women ultimately die from the cancer.

About three-fourths of the women have involvement of the axillary lymph nodes when they first consult a surgeon.

NEWS ITEMS

Dr. J. R. Byrne, a graduate of Creighton University of Omaha, has established practice at Edgemont, S. D.

Dr. C. T. Olson of Wyndmere, N. D., who has been seriously ill at Passavant Hospital in Chicago, is making a rapid recovery.

Dr. H. H. James, of the Murray Hospital Clinic at Butte, Montana, left January 22 for Spokane where he delivered an address on "Cancer and Its Treatment" before the Mendel Scientific Society of Gonzaga University.

The Fort Harrison Veterans' Hospital at Helena, Montana, was reopened February 15th. The institution was renovated after earthquake damage.

Dr. L. F. Hawkinson was elected chief-of-staff of St. Joseph's Hospital, Brainerd. Other officers are Dr. C. E. Anderson, vice-chief; Dr. O. E. Hubbard, secretary-treasurer.

Dr. N. O. Pearce, past president of the Hennepin County Medical Society, was elected president of the Hennepin County Tuberculosis Association at its recent meeting. Dr. Stephen Baxter was named vice-president, and Dr. William H. Aurand, re-elected secretary.

Officers and committees of the Fillmore-Houston-Dodge County Medical Society were elected at their meeting of January 13, at the Mayo Clinic.

Dr. E. C. Smith, Mission, South Dakota, died at his home a few weeks ago of pneumonia. He was 77 years old, and had been health officer in Todd County for many years.

Dr. L. H. Fligman, Helena, Montana, presided at the meeting of the Montana division of the American College of Physicians held February 13th, at Great Falls. A scientific program followed the dinner. Physicians from Billings, Missoula, Helena, and Great Falls, attended.

Dr. I. D. Clark, Jr., son of Dr. and Mrs. I. D. Clark of Fargo, N. D., arrived at Bismarck January 18, to become associated with the Roan and Strauss Clinic of that city. Previous to this time Dr. Clark, Jr., has been a member of the staff of the state school for the feeble-minded at Grafton.

Dr. Louis O'Brien, son of the late Dr. T. O'Brien, who practiced in Wahpeton, N. D., for 46 years, has formed a partnership with Dr. J. H. Hoskins of that village.

Dr. George Sutton, former fellow in the Mayo Foundation, died suddenly of a heart ailment at his home in San Francisco, January 31, on the eve of his fifty-first birth anniversary. Dr. Sutton was born in Prior Lake, Minnesota, and received his B. S., M. D., and M. S. degrees from the University of Minnesota.

The Sixth District Medical Society held a meeting at St. Joseph's Hospital at Mitchell, South Dakota, February 8th. The new officers for 1937 are Dr. Robert A. Weber, president; Dr. J. H. Lloyd, vice-president; Dr. F. E. Boyd, secretary and treasurer; Dr. O. J. Mabee, censor; and Drs. E. W. Jones, and W. R. Ball, delegates.

Dr. W. M. Dummer, physician at Fairfax, Minnesota, since 1923, died February 3. Although only 50 years old, Dr. Dummer had been failing in health for several years, and was forced to retire from active practice last April. After graduation from Northwestern University in 1918, he established practice at Farmington, Minnesota, where he remained until moving to Fairfax.

At a meeting of the Upper Mississippi Medical Society held in Brainerd, January 23, Dr. Z. E. House, of Cass Lake, was elected president. Other officers are: Dr. B. W. Kelly, Aitkin, first vice-president; Dr. Mary Ghostlay, of Puposky, second vice-president; Dr. T. C. Davis, of Wadena, third vice-president, and Dr. G. I. Badeaux, of Brainerd, secretary and treasurer.

At the regular meeting of the Mount Powell Medical Society of Montana, held December 21, 1936, at Warm Springs, Montana State Hospital for the Insane, the following officers were elected for 1937: Dr. T. J. Kargacin, president; Dr. Leo P. Martin, vice president; Dr. Lawrence G. Dunlap, secretary; Dr. John J. Malee, treasurer; Dr. W. E. Long, Dr. H. A. Bolton and Dr. A. J. Willits, censors. Delegates to the state medical convention are: Dr. L. G. Dunlap and Dr. Frank I. Terrill; alternates are Dr. T. J. Kargacin and Dr. Leo P. Martin.

Dr. Joseph E. Schaefer was elected president of the Steele County Medical Society during its recent meeting in that city. Other officers of the society are Dr. Benedik Melby, Blooming Prairie, vice-president; Dr. C. T. McEnaney of Owatonna, secretary-treasurer; Dr. L. V. Berghs, Owatonna, delegate to the Minnesota Medical Society; Dr. C. L. Farabaugh, Owatonna, alternate, and Dr. J. A. McIntyre, Owatonna, censor. Dr. H. Mark of the Minnesota Tuberculosis Sanatorium at Walker, was guest speaker.

Dr. Eugene Kibbey Green, 67 years old, well-known Minneapolis physician and surgeon, died on January 22 in Pasadena, California. Dr. Green, a past president of the Hennepin County Medical Society, had been ill for a year and had gone to California with his wife to rest. Born in Minneapolis, Dr. Green was graduated from the University of Minnesota in 1903. He was a member of the university faculty for some time, and later became one of the owners of the Franklin Hospital, formerly known as Hillcrest Hospital.

He was president of the Hennepin County Medical Society in 1918, a member of the house of delegates of the Minnesota State Medical Association, of the American Medical Association, and of the American College of Surgeons.

Dr. S. A. Slater left Worthington Wednesday, February 10th, for New York City, where he will attend a national tuberculosis clinic.

Dr. W. A. Douglas, 73, a resident of Lamberton, Minnesota, for 24 years, died February 5th, following a long illness.

Doctor O. I. Refsdal, of Austin, Minnesota, died on January 14, 1937, in Austin. He had practiced for some years in Hayfield, Minnesota.

The Washington County Medical Society held its regular monthly meeting in its Stillwater club rooms, Tuesday, February 9th. Dr. M. W. Wheeler, of St. Paul, was guest speaker.

Dr. E. C. Smith, Mission, S. D., died from an attack of pneumonia January 20. He had practiced at Fort Randall, and Lake Andes, and at one time was official physician for the Barnum and Bailey circus. The body was taken to Keokuk, Iowa, for burial.

Floyd W. Burns, M. D., 61, a graduate of the University of Minnesota and the University of Chicago Medical School, and a captain in the medical corps during the World War, was buried in Oakland Cemetery, Saint Paul, Minnesota, on January 22, 1937.

Doctor Charles B. Lenont of Virginia, Minnesota, and Doctor Edward N. Peterson, of the More Hospital in Eveleth, Minnesota, established on February 1 the Lenont-Peterson Clinic in Virginia. Cost of the clinic was between \$25,000 and \$30,000.

Doctor T. R. Vye, of Laurel, Montana, was named chief of the staff of Saint Vincent Hospital of Billings, Montana, on January 11, 1937. Doctor Frank Dunkle is vice president, and Doctor H. T. Caraway is secretary. Both are of Billings. Doctor Phillip Griffin, of Billings, is retiring chief.

Carl William Forsberg, M. D., Ph. D., instructor in pathology at the University of Minnesota Medical School, died on February 21, 1937, in University Hospital. His degree was obtained from the University in 1922; but he was a member of the South Dakota State Medical Association. He practiced in Sioux Falls from 1927 to 1933.

At a meeting of the Blue Earth County Medical Society held at the Mankato Clinic on January 18, 1937, Dr. Charles Koenigsberger, Mankato, Minn., was elected president; Dr. J. C. Vezina, Mapleton, Minn., was elected vice-president; and Dr. George E. Penn, of Mankato, was elected secretary and treasurer.

John Engstad, M. D., 78, a graduate of Rush Medical College of the University of Chicago, and a physician for more than 50 years, died at Grand Forks, North Dakota, on February 19, 1937. Doctor Engstad founded the first private hospital in the Northwest; it is now known as the Deaconess Hospital in Minneapolis. He was a member of the American Medical Editors and Authors Association.

Dr. John P. Rhoads, prominent Montana pioneer, died January 27, at the home of his daughter, Mrs. C. L. Morris, of Laurel. Dr. Rhoads had lived in Montana, since 1882, and had an active part in the forming of the state's early history. He was 86 years old.

On Tuesday, March 2nd, at 8:15 p. m. Dr. Henry E. Sigerist will give the William W. Root Alpha Omega Alpha Lecture at the medical sciences amphitheater at the University of Minnesota. The subject for his talk will be "Leprosy and Plague in the Middle Ages."

The outline of the program of the annual meeting of the Montana State Medical Association meeting, which will be held at Great Falls July 11 to 14, is as follows: July 11, child welfare; July 12, 13, Montana State Health Association; July 14, Academy of Otolaryngology and Ophthalmology. This meeting will be followed by the annual meeting of the Pacific Northwest Medical Association on July 15, 16, 17, 1937.

Dr. Owen King was elected president of the Aberdeen District Medical Society, when 28 members gathered at their annual meeting January 26, at Aberdeen. Other officers elected were; Dr. T. P. Ranney, vice-president; Dr. J. D. Alway, secretary-treasurer; Dr. B. C. Murdy, Dr. J. L. Calene, and Dr. W. D. Farrell, delegates to represent the society at various medical conventions. Alternate delegates were Dr. E. E. Stephens, Dr. J. F. Adams, and Dr. H. I. King.

Dr. W. A. Gerrish, Jamestown, N. D., president of the North Dakota State Medical Association, was guest speaker at the monthly dinner meeting of the Cass County Medical Society held January 29. The new officers of the society for 1937 are: Dr. J. C. Swanson, Fargo, president; Dr. H. J. Fortin, Fargo, vice-president; Dr. E. M. Watson, Fargo, secretary-treasurer; and Dr. J. F. Hanna, Fargo, censor for three years. Delegates to the state convention will be Drs. A. M. Limburg, R. E. Pray, and R. B. Bray, all of Fargo, with Drs. W. G. Brown and G. A. Pages of Fargo, and J. B. James of Page, as alternates. Dr. Pray, Dr. K. E. Darrow, Dr. Bray and Dr. W. H. Long discussed clinical case reports.

On February 5, 1937, Doctor J. Arthur Myers, professor of preventive medicine in the University of Minnesota Medical School, spoke before the Fargo Anti-Tuberculosis Association. On February 8 Professor Myers spoke at the Minneapolis Y. M. C. A.; on February 9 he addressed the Tenth District Nurses' Association at the Sacred Heart Hospital in Eau Claire, Wisconsin; and on the evening of the same day he addressed the Chippewa County Medical Society in Chippewa Falls, Wisconsin. On February 22, Doctor Myers was the principal speaker at the combined meeting of the Colorado Tuberculosis Association and the Denver Sanatorium Association at the Denver University Club; and on February 24, he spoke before the scientific forum of the Minneapolis Public Library on "The Breath of Life."

Twenty-five years of pioneering in medical education in North Dakota were publicly recognized when friends and associates attended a testimonial dinner given for Dean H. E. French at Grand Forks on February 5. Speakers who paid tribute to the veteran University of North Dakota dean of the School of Medicine included two former students, Dr. John S. Lundy, of the Mayo Clinic, and Dr. C. R. Tompkins, of Grafton, N. D.

Seven persons were licenced to practice medicine and surgery in the state of North Dakota by the State Board of Medical Examiners on January 11, 1937. They are as follows: Dr. Fred E. Kolb, Granville; Dr. Christian G. Johnson, Rugby; Dr. Harriet Bixby, Bismarck; Dr. Erwin Edward Stephens, Eureka; Dr. Louis T. O'Brien, Wahpeton; Dr. Ralph Vinjie, Hillsboro; and Dr. Lenier A. Lodmell, Grand Forks.

At a meeting of the Stutsman County Medical Society at Jamestown, North Dakota, February 4th, Dr. Harry Fortin, of Fargo, gave a very interesting paper on "Fractures." The new officers for 1937 are: Dr. J. L. Conrad, Jamestown, president; Dr. W. E. Longstreth, Kensal, vice-president; Dr. Bertha Brainard, retiring president, secretary-treasurer; Dr. Floyd O. Woodward, Jamestown, delegate; and Dr. T. L. DePuy, Jamestown, alternate.

William A. O'Brien, M. D., associate professor of pathology and preventive medicine in the University of Minnesota Medical School at Minneapolis, is the speaker for the Minnesota State Medical Association's radio broadcasts for March, over Station WCCO (810 kilocycles, 370.2 meters). The broadcasts are given each Thursday afternoon at 2:30 p. m. On March 4 the subject is: "Parents & Children"; on March 11 it is: "Dementia Praecox"; on March 18 it is: "Pneumonia"; on March 25 it is: "Periodontia."

Dr. Carl A. Feige, 58, died January 26 after an illness of two months. Spending the early days of his practice in Kansas City, Dr. Feige came to South Dakota in 1924. After being in Iroquois and Huron, he settled in Canova, in 1928. Dr. Feige was appointed a member of the State Board of Medical Examiners by Governor Green, and was re-appointed to the post by Governor Berry. Of a very public-spirited nature, Dr. Feige took great interest in the community affairs. As a member of the town council and mayor for several years, he helped in the building of the town park. He was a Master Mason, a member of the Consistory, and a Shriner.

The American College of Surgeons will hold a sectional meeting at Seattle, Washington, on March 31, April 1, and 2, 1937. The following states and province will participate: Washington, Oregon, Idaho, Montana, British Columbia. According to the program scheduled, the meeting should be of great interest to all physicians and hospital superintendents, and everyone is invited to attend. There will be no registration fee. A general outline of the program will include: technical and scien-

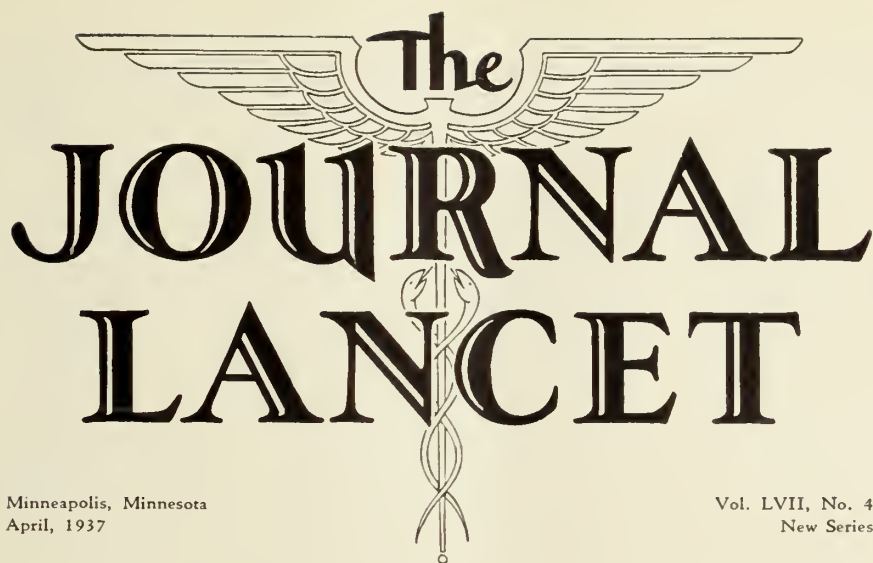
tific exhibits; hospital conferences; round table discussions; medical motion pictures; special clinics on cancer, fracture, and eye, ear, nose and throat, and a dinner for fellows of the College. Headquarters will be at the Olympic Hotel.

Julian F. DuBois, M. D., secretary of the Minnesota State Board of Medical Examiners, Saint Paul, Minnesota, advises THE JOURNAL-LANCET that on February 2, 1937, Judge Levi M. Hall, of the District Court of Minneapolis, sentenced one Mary Lovold (*alias* Mary Gaslin), 71, to a term not to exceed 4 years in the Woman's Reformatory at Shakopee, Minnesota. The person named pleaded guilty on November 31, 1936, to performing a criminal abortion on a 28-year old girl of Princeton, Minnesota. The girl is still at the Minneapolis General Hospital, unable to receive medical treatment because of persistent abscesses. Judge Hall suspended sentence on the guilty woman because she is suffering from carcinoma, placing her in the custody of a Hennepin County probation officer.

Dr. C. L. Sherman, of Luverne, Minnesota, was named president of the Sioux Valley Medical Association at the closing session of their annual meeting, which was held at Sioux City, January 19 and 20, 1937. Other officers include: Dr. N. J. Nessa, Sioux Falls, S. D., vice-president; Dr. H. I. Down, Sioux City, re-elected secretary; Dr. Walter Brock, Sheldon, Iowa, re-elected treasurer. Dr. H. J. Brackney, of Sheldon, and Dr. W. H. Halloran, of Jackson, Minnesota, were re-elected to the board of censors, while Dr. W. F. Bushnell of Elk Point, S. D., was named to the board to succeed Dr. Nessa. One of the features of the meeting was the presentation of honorary certificates to the physicians who have been members of the association for more than twenty-five years. The presentation was made by Dr. W. R. Brock of Sheldon, who was introduced by the toastmaster, Dr. Gilbert Cottam, of Minneapolis.

A one day Congress of Allied Professions and a Northwest Industrial Medical Conference will be features of the annual meeting of the Minnesota State Medical Association, which will be held in the St. Paul Auditorium, May 2 to 5, 1937. Discussion of current social and economic problems from the point of view of the various professions will occupy the morning program. The afternoon will be devoted to addresses by officials of Washington and representatives connected with the social security program.

An extensive exhibit section is planned. Included in this list will be: the prehistoric girl discovered by A. E. Jenks, Ph. D., professor of anthropology at the University of Minnesota; a cancer exhibit, in cooperation with the American Society for the Control of Cancer; endocrinology, by Dr. L. F. Hawkinson of Brainerd; hand infections, Dr. Hamlin Mattson, Minneapolis; ophthalmology and otolaryngology, Dr. Frank E. Burch, St. Paul; and many others. An entire hour each morning and afternoon during the three days will be devoted to inspection of exhibits and scientific demonstrations.



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This issue, devoted exclusively to the subject of Tuberculosis, is published in conjunction with the National Tuberculosis Association.

INTRODUCTION

MAN, TUBERCULOSIS AND SUPERSTITION

Kendall Emerson, M. D.*

New York City

THE figure of SAMUEL PEPYS, famous diarist of the 1660's, walking home with a rabbit's foot in one pocket and a copy of HOOKE's *Book of Microscopy* in the other, still stalks the pages of our daily lives.

Man looks out on the world about him, clutching Science with one hand, anxious for its benefits, yet clinging firmly with the other to the superstition of the ages.

Tuberculosis is conquerable. Causes are known. Methods of transmission are known. Treatments are known. *Man* is the great *unknown* quantity—man with all his negating attitudes and his ridiculous mental impediments.

It is the doctor's high mission—indeed, his first mission—to strip him of these "rabbits' feet," not always so obvious as the furred little legs of our woodland friends, however, because civilization's veneer has dressed them up more subtly. But the "rabbits' feet" are there, nevertheless. And they must be taken out of man's pocket and man's mind.

Then he will be free to value his body as he should.

And that bright day will have arrived when the tiny tubercle bacillus is discovered as it starts its career of destruction rather than as it completes it.

*Managing Director, National Tuberculosis Association.

Errors in the Diagnosis of Pulmonary Tuberculosis*

J. O. Arnson, M.D.**

Bismarck, North Dakota

WE ARE well aware of the difficulties attendant upon the early diagnosis of tuberculosis, and with the increasing knowledge which medical science has given us, more cases of early tuberculosis come under treatment every year. During the past ten years, specialists in sanatoria observe that the general practitioner is sending for treatment more cases of early and fewer cases of advanced tuberculosis. This healthful state of affairs demonstrates the increasing diagnostic ability of the medical profession. Some time ago I heard a group of people interested in tuberculosis work state that, with the "modern armamentarium," tuberculosis is more-readily diagnosed and earlier recognized; which, with increasing public interest, is true.

Of the modern means available for diagnosis, the X-ray is perhaps the most important. A great deal of reliance is placed on X-ray diagnosis of tuberculosis, and rightly so, because without the X-ray we would often be handicapped in this work. Yet, it must be borne in mind that the X-ray is an accessory to the examination; however, a necessary one; and the clinical history, physical findings, temperature and pulse records, sputum examinations and tuberculin tests play an important and often deciding rôle in making a correct diagnosis.

Even in advanced types of disease it has been our experience to find the X-ray fallible, leading us astray, if we place too much dependence upon it. Realizing the great chance of error in placing too great reliance on the X-ray film, we would like to call your attention to a group of conditions in which the X-ray findings are confusing and in which other methods of examination are essential.

Lobar Pneumonia

It sometimes occurs in the course of a lobar pneumonia, particularly if the course is atypical and resolution is delayed, that the question arises as to whether or not tuberculosis is present. Active cases of pulmonary tuberculosis may develop any of the types of pneumonia. In this event, X-ray plates may prove confusing. In lobar pneumonia the consolidation is not always uniform throughout the affected lobes. During resolution, absorption does not occur at the same rate in all parts of the consolidated area with the result that the shadow produced is mottled. If plates are taken fairly late during the period of resolution, areas of early and more complete resolution will show such variations of aeration that cavitation may be simulated. It is clear, then, that the X-ray plate may show lesions very characteristic of tuberculous infiltration and even cavitation. This error

may be avoided by continuous observation. If the pathology is produced by pneumonia, the infiltration clears in a few weeks and other corroborating evidences of tuberculosis are absent.^{1, 2} (Fig. 1.)

Bronchopneumonia

In this condition, the X-ray will show soft, mottled shadows in one or more lobes, and if the lesion is confined to an upper lobe, the simulation of tuberculosis will be greater. However, if bronchopneumonia is confined to one lobe, it usually chooses one of the lowers. The differentiation between a simple, slowly-resolving bronchopneumonia and tuberculous infiltration depends on the absence of positive tuberculous findings and the fact that bronchopneumonia clears in ten days to three weeks, while tuberculosis requires much longer. (Figs. 2 and 3.)

Suppurative Bronchopneumonia

The severer types of this infection are not so likely to be mistaken for tuberculosis because of the great density of the shadows; but less severe cases show smaller and fainter infiltrations, and when these are situated in the upper lobes, they may lead to a suspicion of tuberculosis. To make a definite differentiation, repeated X-ray examinations are indicated.

Gangrenous Bronchopneumonia

This condition is the early stage or precursor of lung abscess, and presents a dense, homogeneous shadow which, when located in an upper lobe, may simulate early exudative tuberculosis. Gangrenous bronchopneumonia is recognized by the foul sputum which is persistently negative for tubercle bacilli and the early cavity formation which occurs in from ten days to two weeks. (Fig. 4.)

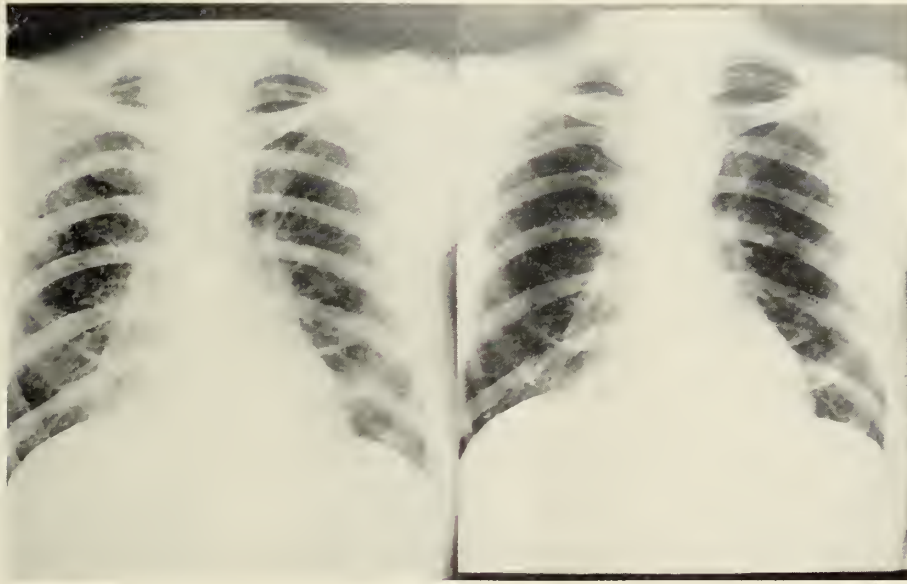
Tuberculous bronchopneumonia may simulate the early stage of lung abscess, when it is a single localized lesion, but when it occurs diffusely through the lung, it cannot be differentiated from lobular or suppurative bronchopneumonia except by its course and clinical findings.

Abscess of the Lung

In the earliest stage, pulmonary abscess is not different from any other localized consolidation. The site of predilection is the apex of one of the lower lobes or the axillary and anterior portion of the upper lobes. (Fig. 5.) The course, that is rapid cavity formation in ten days to two weeks, and the location, help to distinguish the lesion. Greater difficulty in differentiation occurs when a tuberculous cavity is found in a lower

*Presented before the Rocky Mountain Tuberculosis Conference, Albuquerque, N. Mex., September 29, 1936.

**From the medical service, Quain and Ramstad Clinic, Bismarck, N. D.



A.

B.

FIGURE 1

A. Resolving bronchopneumonia showing areas of infiltration in right upper which resemble tuberculosis. Annular shadows present simulating cavitation.

B. Same chest three weeks later shows complete resolution. Sputum negative for tubercle bacilli.



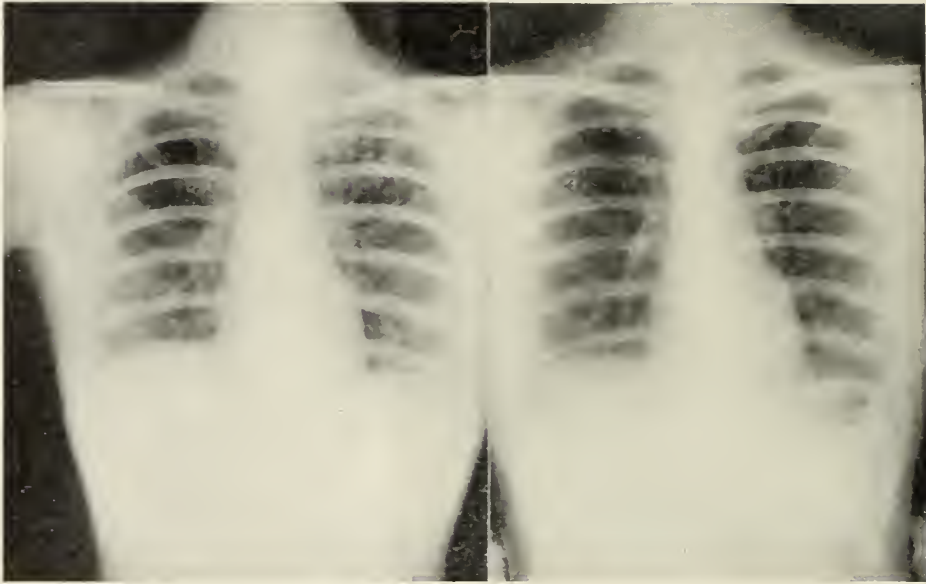
A.

B.

FIGURE 2

A. Resolving lobar pneumonia simulating massive tuberculous infiltration.

B. Same chest three weeks later showing complete resolution. This case had a history of joint tuberculosis. Sputum persistently negative for tubercle bacilli.



A.

B.

FIGURE 3

A. Tuberculous infiltration left upper lobe simulating broncho-pneumonia.
 B. Same chest three months later shows resolution.
 Sputum negative for tubercle bacilli.



FIGURE 4

Gangrenous bronchopneumonia in right upper lobe showing early stage of cavity (abscess) formation.

lobe, which sometimes occurs. (Fig. 6.) However, continuous clinical observation and repeated sputum examinations make the diagnosis clear.

Bronchiectasis

Bronchiectasis has frequently led to difficulties in its clinical recognition, and instances are known when tu-

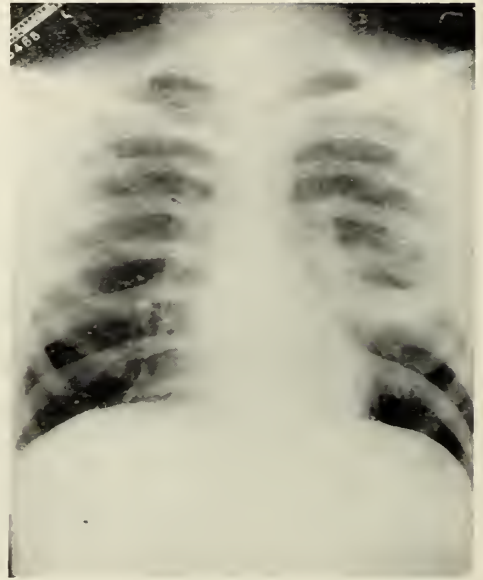


FIGURE 5

Abscess of lung showing typical situation in upper portion of left lower lobe.

berculosis has been suspected and diagnosed. The X-ray film made after lipiodol instillation makes the diagnosis certain. There are, however, instances when tuberculosis may produce areas of localized bronchiectasis. In long standing chronic types of pulmonary tuberculosis, bronchiectasis may occur in the tissue adjacent to the lesion.

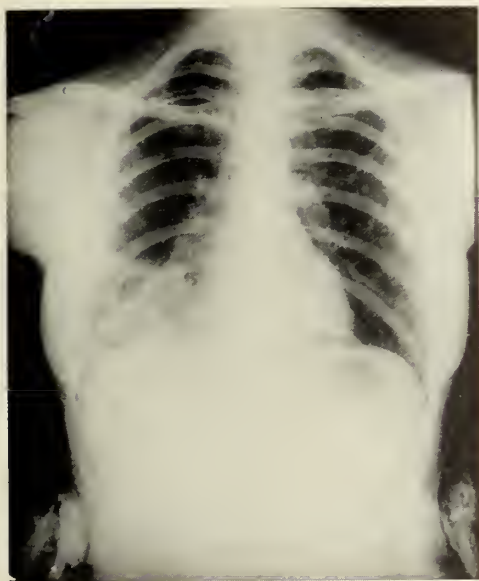


FIGURE 6

Tuberculous infiltration with cavity in right lower lobe, simulating gangrenous bronchopneumonia with abscess. Sputum positive for tubercle bacilli.

In these cases, bronchial dilatations persist. They are often large and irregular, and are confined to the area involved by the tuberculous lesion.

Silicosis and Anthracosis

In these lesions, we have had no experience, but in mining and quarrying regions where these conditions are common, it is recognized that at times they are readily confused with pulmonary tuberculosis. In such instances clinical observations are the deciding factors in making the diagnosis.³

Streptothricosis, Sporotrichosis, and Leptothrix Infections

In these diseases, the pathology is that of a granuloma which produces either a localized or a diffuse pneumonic process, and in the diffuse type differentiation from tuberculosis by the X-ray is impossible. Many of these cases are diagnosed and treated as tuberculosis. The differentiation can only be certain by recovering the causative organism or the tubercle bacillus from the sputum.⁴

Syphilis

Syphilis of the lung is characterized by an interstitial fibrosis and is so rare that its consideration is nearly unnecessary. The only confusion we have had called to our attention was due to the unusual enthusiasm of some syphilographer. Most of the errors in this category come from diagnosing tuberculosis as syphilis. It must be remembered that tuberculosis can be present in a person who has a positive Wassermann from syphilis, a fact upon which some enthusiastic clinicians place too little credence.

Neoplasms

Neoplasms of the lung or bronchi cause confusion because of the pathologic changes which occur in the lung tissue as a result of obstruction to a bronchus. The density of the lung thus obstructed may frequently lead to a suspicion of tuberculosis. In many instances, however, the collapse of the lung can be readily seen and a correct interpretation can be made early and readily. The error in confusing this type of collapse with a tuberculous lesion was more frequently made in the early days of chest roentgenography, but with increasing knowledge and better interpretation it rarely occurs.

In infiltrating types of carcinoma and diffuse carcinomatosis, the differentiation is not so easy and many of

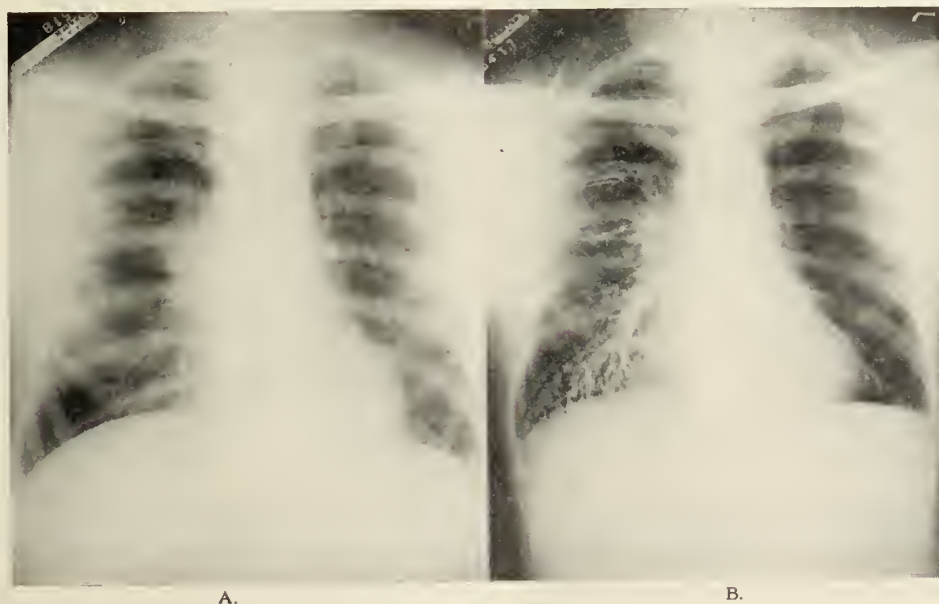


FIGURE 7

A. Density in right middle lobe due to collapse from obstruction of bronchus by neoplasm.
B. Lipiodol injection in same case reveals obstruction of right middle bronchus.



FIGURE 8

Infiltrating type of carcinoma of lung simulating extensive tuberculous infiltration. Sputum negative for tubercle bacilli. Malignancy proved at autopsy.

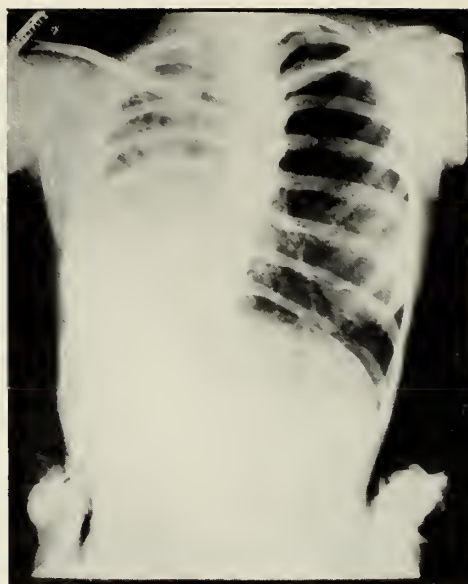


FIGURE 10

Congenital cystic disease of right lung showing areas of massive collapse and the walls of the cysts as coarse trabeculations.



FIGURE 9

Extensive malignant infiltration of right lung.

these are confused with tuberculosis for varying periods, until the course of the disease indicates the correct diagnosis. (Figs. 7, 8 and 9)

Cystic Disease of the Lung

This condition, which is unusually rare, is important in relation to the subject we are discussing because one case which came to our attention had been under treatment for tuberculosis for several years. Especially when the victims of cystic disease of the lung are suffering

from malnutrition and general physical debility, with superficial observation the error in diagnosing tuberculosis may easily occur. The X-ray findings which show areas of collapse and coarse trabeculations, the walls of the cysts, are characteristic. This, with consistently negative tuberculosis findings, should make the diagnosis. (Fig. 10)

In conclusion, we would emphasize the necessity of careful and detailed study and constant observation in cases of obscure pulmonary lesions. In spite of the confidence which has rightly been placed in the "modern armamentarium" in the fight against tuberculosis, particularly the X-ray, let us sound a warning that it is a fallible ally, and that painstaking clinical observations and sound clinical judgment still are the most important factors in arriving at a correct diagnosis.

By following these precepts we will make fewer errors in the diagnosis of pulmonary tuberculosis.

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Indications and Contraindications for Bronchoscopy*

In the Management of Pulmonary Tuberculosis

Porter P. Vinson, M.D.

Richmond, Va.

THE MORE general employment of bronchoscopy in the management of pulmonary diseases raises the question as to the indications and contraindications for this examination in patients suffering from pulmonary tuberculosis. Although opinions vary as to the indications for bronchoscopy in the patient with tuberculosis, there seems to be general agreement that direct visualization of the tracheobronchial tree should not be made a routine examination in patients suffering from this disease. Bronchoscopy can be performed with a minimal amount of discomfort and very little risk, but when it is employed in the patient with pulmonary tuberculosis, complications which arise thereafter may be attributed to the passage of the bronchoscope. It would seem advisable, therefore, to limit bronchoscopy in the patient with pulmonary tuberculosis to the examination and treatment of those lesions which cannot be diagnosed and relieved by more conservative measures.

It hardly is necessary to say that unless the patient's general condition is critical as the result of tuberculosis, bronchoscopic examination is required when a foreign body is present or thought to be present in the air passages. It would not seem wise, however, to recommend bronchoscopy in such a patient even for the removal of a foreign body from the air passages, if the foreign body had been aspirated during the terminal stages of the disease.

Although tuberculosis in the lungs is infrequently associated with malignant disease, carcinoma of the trachea or bronchi may develop in the tuberculous patient. Without bronchoscopy, this complication cannot be diagnosed and differentiated from hyperplastic tuberculosis with the formation of tumor. Whenever tracheal or bronchial obstruction is evident in the patient with tuberculosis, bronchoscopy is indicated to determine the character of the obstructing lesion.

The majority of tuberculous lesions in the tracheobronchial tree are associated with the presence of bacilli of tuberculosis in the sputum, although tuberculosis involving the hilar area and resembling primary carcinoma of a bronchus is a notable exception. Many of these lesions represent tuberculosis of the hilar lymph nodes with ulceration into the lumen of a bronchus. Bacilli of tuberculosis are rarely found in the sputum of these patients, and the diagnosis of tuberculosis is made from the microscopic study of tissue removed bronchoscopically from an infiltrated or ulcerated bronchus. At times no ulceration or infiltration is evident in the wall of the bronchus in this type of lesion and, when such is the case, the removal of tissue for microscopic examination is inadvisable. The fact that infiltration of the

bronchial wall is not observed suggests that the underlying lesion is tuberculous. When a malignant lesion is demonstrable by roentgenoscopic study, bronchoscopy almost always reveals evidence of infiltration or ulceration of the bronchial wall.

The presence of a foreign body, particularly a pulmonary calculus, may produce the signs, symptoms and roentgenoscopic appearance of a hilar tuberculous lesion, and repeated bronchoscopic examination may be required to demonstrate and remove the cause of the inflammatory disease. When the foreign body is embedded in a mass of inflammatory tissue, the differentiation of this type of lesion from tuberculosis or malignant disease is especially difficult.

Bronchoscopy may be required to determine the source of bleeding from the lungs when tuberculosis is present in both lungs and collapse therapy is contemplated. In many instances, ordinary methods of examination are inadequate to locate the origin of the hemorrhage.

Ulceration of the larynx resembling tuberculous infiltration is not a contraindication to bronchoscopy if bacilli of tuberculosis are not present in the sputum. Simple laryngeal ulceration resulting from the traumatic effect of excessive cough may resemble tuberculous laryngitis, and this type of ulceration is not aggravated by the careful introduction of a bronchoscope. If an associated pulmonary lesion cannot be diagnosed without direct inspection of the tracheobronchial tree, bronchoscopic examination should be made.

Because of beneficial results obtained from the bronchoscopic aspiration of pulmonary abscess one may be tempted to employ similar treatment in pulmonary tuberculosis with cavitation. Although this type of treatment cannot be condemned as hazardous and without value, it probably is an unwise procedure. Many cavities in the lung due to tuberculosis resemble those resulting from pulmonary abscess and, before bronchoscopic examination is undertaken, careful study of the sputum for bacilli of tuberculosis should be made in all patients having expectoration of secretion.

With or without bronchoscopy the injection of medicated solutions into the tracheobronchial tree in patients suffering from pulmonary tuberculosis is a practice which should be discouraged. There is little evidence to support the belief that local application of drugs is beneficial in any tuberculous lesion. Recent reports of disastrous results following the injection or aspiration of various oils into the respiratory tract should be sufficient warning that their employment in the diagnosis and treatment of any type of pulmonary disease should be made with caution.

*Prepared expressly for the special Tuberculosis issue of THE JOURNAL-LANCET.

Conclusions

Bronchoscopy should not be carried out as a routine procedure in patients suffering from pulmonary tuberculosis. Definite indications for direct inspection of the tracheobronchial tree in the patient with tuberculosis are enumerated. Before bronchoscopic examination is undertaken the sputum should be examined for the presence of bacilli of tuberculosis in all patients having secretion from the tracheobronchial tree. The bronchoscopic aspiration of cavities resulting from pulmonary tuberculosis is not considered a wise procedure. Local treatment

of tuberculous lesions by means of drugs or medicated solutions is not advisable. The injection of oils, either plain or medicated, for the diagnosis and treatment of any type of pulmonary lesion should be made with caution.

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The Youth Sector*

In the Fight Against Tuberculosis

William J. Ryan, M.D.**

Pomona, N. Y.

IT IS obvious from the subject which has been assigned to me, namely, "What Examination Methods Are Recommended or Discouraged," in the case-finding of tuberculosis among the young, that no standards have yet been generally adopted. This fact was fully realized two years ago by Dr. Charles H. Keene, of Buffalo, then president of the American Association of School Physicians, when he appointed a committee, known as "The Committee on Tuberculosis of the American Association of School Physicians," the membership consisting of Dr. J. Arthur Myers, of Minneapolis, as chairman; Dr. Esmond R. Long, of the Henry Phipps Institute, Philadelphia; Dr. H. D. Lees, also of Philadelphia; Dr. Wm. Paul Brown, of Albany, N. Y., and myself.

The purpose of this committee was to formulate standards in the examination of school and college students for tuberculosis with the idea that such standards might be adopted throughout the country. The group met during the annual meeting of the National Tuberculosis Association at Saranac Lake in 1935, and again during a similar meeting which was held last month in New Orleans. The recommendations adopted by this committee were published in the December, 1935, issue of *The School Physician's Bulletin*, and a further report will soon appear in the monthly bulletin of the National Tuberculosis Association. I refer to this committee, because the methods to be discussed here will consist in the main of those recommended by that group.

It is now generally accepted that the tuberculin testing of students, regardless of age, followed by the

X-raying of the reactors with the use of celluloid films, is the ideal procedure. We are, however, cognizant that the ideal program cannot be carried out completely in every community for various reasons, such as a lack of sufficient funds, trained personnel, or even because of fanatical opposition. However, in regard to the promiscuous X-raying of children and high school students without first screening-out the negatives by tuberculin testing is, in my mind, both unscientific and an unnecessary waste of funds; it is unscientific because we know that certain X-ray shadows which are on the borderline of pathology may be significant in the presence of a positive tuberculin reaction; while, on the other hand, they may be disregarded if the tuberculin test is negative, and those of us who have had experience in the interpretation of chest films of the young, realize how difficult it often is to evaluate the significance of slight X-ray shadows and, without knowing whether or not that person is sensitive to tuberculin, we are frequently in a still greater quandary. We feel that the procedure of promiscuous X-raying is an unnecessary waste of time and funds, because in certain communities as many as 75 per cent of students will be found negative to tuberculin, and in such cases, except for the occasional one, the X-ray film serves no purpose.

There are some who will claim that consent for the tuberculin testing cannot be obtained in their communities; I feel, however, that with the proper education of the public, the school authorities and school faculty, together with good coöperation from the medical profession, that from 80 per cent to 85 per cent of consents should be obtained. Some may retort that they are unable to educate their public, that they cannot obtain the necessary coöperation from the school officials and

*Presented at the Annual Conference of the State and Local Committees on Tuberculosis and Public Health, State Charities Aid Association, Hotel Biltmore, New York City, May 20, 1936.

**Medical Director, Summit Park Sanatorium, Pomona, N. Y.

medical profession. My only answer is that the fault more likely lies with the workers themselves than with the people of their community; that human nature varies but little in different sections of the country; and that public health workers who experience such difficulties should first look to themselves and improve on their own technique in education and approach.

As to the type of the testing material; the committee recommends that the purified protein derivative, known as the P.P.D., should be the tuberculin of choice. The advantages are, first: similar doses are constant in potency and stability, whereas with the O.T., the best of them vary in strength due to conditions of manufacture. We recently had the experience of several -|- -|- -|- -|- reactions with old tuberculin from a most reliable laboratory, although the same measured dose from the same laboratory had, in former years, been administered to thousands of children with but a very few severe reactions. We have also been told that many preparations of old tuberculin, furnished by city and state laboratories, as well as commercial, are too weak to give satisfactory results. Again, it has been demonstrated by Plunkett, Siegal and others, that the percentage of reactors with the average test dose of P.P.D. is higher than with old tuberculin. The disadvantage of the P.P.D. is the need for more than one dose. Consent for the administration of more than one test complicates the survey, particularly in the public school studies. Long has recently informed us that a single-dose method which is practical will probably soon be found. Another disadvantage of the use of the purified protein derivative is its cost.

X-RAY: The ideal method is the use of celluloid films with the high milliamperage equipment and short exposures. This, however, can be done only by transportation of the students to hospitals or sanatoria. Our own experience has demonstrated the great value of such a procedure, and our trend is constantly in that direction. Films with a portable X-ray apparatus are not yet entirely satisfactory, due to the long exposure time, resulting in heart or body movement. It is hoped that manufacturers will be able to furnish us with high-power portable equipment for this type of work. However, with care in technique, films with portable equipment are fairly satisfactory in perhaps 90 per cent of cases. It should, however, be understood that where there is a questionable shadow seen on the portable film, the patient should be re-X-rayed with the use of a high-power machine.

The committee has sanctioned the use of the so-called "rapid X-ray method" with paper films for large communities where time and expense are factors. While such films are not yet universally recognized as equal to the standard, transparent celluloid, it is the opinion of the committee that they are sufficiently satisfactory for recommendation when circumstances warrant their use.

The speaker has had no experience with the use of fluoroscopy in the routine detection of pulmonary lesions in the student. My impression, however, as the result of considerable fluoroscopic experience in sanatorium régime, is that many early, less-dense lesions might easily escape detection under the fluoroscopic screen, although some workers, notably Fellows, of the Metropolitan Life Insurance Company, report very gratifying results. While fluoroscopy is far better than no study at all, we are inclined to refrain at present from recommending this as a routine procedure to the exclusion of the X-ray film until further convincing data of its value is available.

And finally, I will digress for a moment from the assigned topic and briefly comment on the relative value of this work; I am for it, especially among the older groups. We have examined upwards of 13,000 children during the past six years, and expect to continue. However, I am wondering if the present enthusiasm for this school study, which is now sweeping the country, may not in some communities at least, especially where funds, personnel and time are limited, be overshadowing and causing to be pushed in the background the investigation for our fundamental source of tuberculosis, namely, the contacts. It is among the latter group that the richest harvest of our efforts will be reaped, and I am frank to admit that if all of our contacts were as thoroughly followed-through in the past as we are doing at present, the number of new cases discovered in the schools would be considerably less. If we would compare the percentage of newly-discovered cases among our examined contacts, I am certain that it will far outweigh those found among the apparently healthy school children. Let us first ask ourselves, "Are we doing this job completely?"

This idea of examining school children is an excellent one and, wherever possible, should be encouraged and continued; but let us first thoroughly till the fertile field and reap the maximum harvest from our known contacts before we venture to spade the more barren soil of investigating the average apparently well group.

The Willard Bequest

What Form Should It Take?

An Expression of Opinion from the Wisconsin
Anti-Tuberculosis Association

Hoyt E. Dearholt, M. D.,* and Staff

Milwaukee, Wisconsin

FOREWORD—Several years prior to her death, the public-spirited widow of a public-spirited Wisconsin physician drafted a will which set up a substantial sum of money to be used by the trustees of her county's tuberculosis sanatorium for "the erection, construction, and equipment of a children's preventorium, being a sanatorium for the prevention and care of tuberculosis among children." Between the drawing of the will and its admission to probate, much change of mind had occurred among physicians, social workers and the trustees themselves concerning the efficiency of domiciliary care of "pre-tuberculosis children" as a practicable means of preventing tuberculosis as a deadly and disabling disease later in life.

The Wisconsin Anti-Tuberculosis Association was asked to assist the trustees and the court and the following brief was read into the record. It has seemed to the editors that it will be interesting to THE JOURNAL-LANCET readers, partly on account of local references, but rather more as an epitomization of responsible but disinterested social planning.

Since its organization in 1908, the Wisconsin Anti-Tuberculosis Association has been actively interested in the establishment and efficient operation of Wisconsin sanatoria. As a matter of fact, only because of its year in and year out efforts have many Wisconsin institutions come to be built at all. Once they have been established, the Wisconsin Anti-Tuberculosis Association has felt an obligation to help sanatorium administrators keep their institutions abreast of the best current thought regarding the treatment and cure of tuberculosis.

Realizing this interest, and realizing, too, the specialized knowledge and resources of the Wisconsin Anti-Tuberculosis Association, the trustees of Mount View Sanatorium have kept the Wisconsin Anti-Tuberculosis Association informed of developments in regard to the Willard bequest, and have appealed to it for information and advice. Several staff workers of the Wisconsin Anti-Tuberculosis Association have given considerable thought and discussion to the question of how the letter and spirit of Mrs. Willard's bequest can best be met—as well as the needs of Marathon County—and the present brief is an attempt to summarize our discussion and opinion.

Three Proposals for Fulfilling Bequest

Three general proposals for use of the fund appear

*Executive Secretary, Wisconsin Anti-Tuberculosis Association.

to be most under discussion. Each will be discussed in turn.

(1) Use of all of the bequest in the building of a preventorium on conventional lines; and of as large a capacity as the funds will permit.

(2) Use of all or part of the bequest for improving the physical set-up of Mount View Sanatorium—that is, needed surgical facilities, central heating plant, etc.

(3) Use of all or part of the fund in developing a tuberculosis prevention program among all Marathon County children, rather than a selected few whom a preventorium of the old-fashioned type could benefit.

I. The Preventorium

The terms of Mrs. Willard's will are that the "fund be used for the erection, construction, and equipment of a Children's Preventorium, being a sanatorium for the prevention and cure of tuberculosis among children," etc., and that "should such share of the residue [of the estate] be insufficient to properly erect and construct such a Children's Preventorium," the fund be used for the maintenance and improvement of Mount View Sanatorium.

From the terms of her will, Mrs. Willard's fundamental interest was obviously in the "prevention and cure of tuberculosis among children." Tuberculosis among children is a subject about which there exists even today much confusion in thinking, not only as to what treatment is necessary, but as to what the condition itself is.

There are two or three sharply distinct types of "tuberculous" children.

First, there are the children with a bone or joint tuberculosis. Europe has many of these, due, perhaps, to the fact that bovine tuberculosis, which is believed responsible for much of this extra-pulmonary form of the disease, is so generally prevalent across the ocean; states like Wisconsin now have comparatively little. The probable number of such children's cases in Marathon County is too small to justify special capital construction, especially since adequate facilities are available at the State General Hospital at Madison and in the Milwaukee Children's Hospital.

Children With "Adult Type" Disease

Second, children with active disease of the so-called "adult pulmonary type"—that is, tuberculosis as it is commonly understood. Children do not appear to be so

susceptible to pulmonary tuberculosis as late teen-age adolescents or young adults, or even middle-aged adults. Thus, last year in Wisconsin, only 35 children in the entire state between five and 15 died from tuberculosis, about two-thirds of these from pulmonary tuberculosis. Between 15 and 25, 156 died; between 25 and 35, 210; between 35 and 45, 187, etc.

Treatment of these children, authorities pretty generally agree today, should be little different from that for adults with "adult type" pulmonary tuberculosis—that is, sanatorium bed rest, with chest surgery when indicated. Children should, however, be kept in a separate wing or corridor of the sanatorium. Children are not adults; they need separate environment, different care and guidance. The mixing of sick children with sick adults in a sanatorium is undesirable physically and morally.

"Pre-tuberculous" Children

Third, the so-called "pre-tuberculous" children—that is, children without active lung disease, but with some initial infection as indicated by a positive reaction to the tuberculin skin test. These constitute the vast majority of children usually treated in preventoria. (Incidentally, they also comprise more than 15 per cent of all Wisconsin children of high school age.) They may or may not come from tuberculous homes, though children placed in preventoria are usually those who are "run-down" physically or who would otherwise remain in contact with an active case of the disease in their own home.

What should be done with these children? A few years ago, when Mrs. Willard's will was drawn, institutional treatment over a period of months or years for children who had been intimately exposed to tuberculosis seemed the most promising way of safeguarding their future. Moreover, the difference between first infection among children and subsequent "adult type" tuberculous disease which, as stated above, occasionally manifests itself among them, was not clearly understood.

But scientific knowledge in the field of tuberculosis, particularly childhood tuberculosis, has grown tremendously during the last half dozen years. Our concepts of the disease as it manifests itself among children have become clarified; our concepts of proper control measures have changed proportionately. Much research work has been done, old emphases shifted.

Today, for example, most authorities question whether expensive preventorium care is necessary or even advisable for children infected but not diseased. Some "building-up" benefit, without doubt, is afforded the child. But is the benefit permanent enough to justify the expense? many investigators ask. In most cases, upon discharge a year or two later, they answer, the child steps right back into the unfavorable home environment from which he was removed, and the "building-up" is largely lost.

The experience of Minneapolis may be cited. For many years this city maintained one of the outstanding

preventoria of the country, Lymanhurst. It was abandoned a few years ago. In a recent article in *The American Review of Tuberculosis*, its director, Dr. J. A. Myers, one of the most distinguished authorities in the country on childhood tuberculosis, describes, with some of his colleagues, a study of 155 children with first-infection type of tuberculosis who had been observed over a period of several years, some since 1921. They write: "The first group consists of those whom we sent to sanatoria; the second, of those sent to a special school (Lymanhurst); and the third, of those who remained at home with no treatment except that every effort was made to break the contact when an open case of tuberculosis existed in the home or among other close associates. . . . Among the 136 traced, we are unable to see any difference in the course of the disease, regardless of whether the children were treated as strict bed-patients, were sent to a special school, or remained as active as any normal child is in its home."

Summing up their findings, these investigators report that as far as primary tuberculosis (first-infection type) is concerned, "we have not been able to obtain any evidence to show that hospitalization, special schools, camps, or any other form of treatment except breaking contact with tubercle bacilli, has any particular influence upon the later development of reinfection type disease" (that is, adult type disease).

Other Considerations

Three or four other observations should be made regarding preventorium or other institutional care of children infected but not diseased.

They should not be mixed with children with adult type disease. Children, more than adults, are difficult to keep segregated in their own rooms. To mix diseased with non-diseased children—as is more or less inevitable in an old-type preventorium if and when the distinction between these two very different groups is forgotten—is thoroughly bad practice. In fact, undesirable as is the mixing of children with "adult type" disease and grown-ups with active adult disease, this mixing of actively diseased children with merely infected children is even worse. Therefore, when and if a preventorium were built for Marathon County's "pre-tuberculous" children, some facilities would still have to be worked out for children with active "adult type" disease.

The temptation in preventoria is to hold children too long. Instances have been known where children have been kept far beyond any reasonable need on the child's part in order that beds might remain filled and per capita down. The superintendent and nurses grow fond of their children and rationalize their desires not to part with them. And then there is a tendency of all of us to remain rutted in well-worn grooves.

Again, when the child is finally discharged, he all too often, as suggested above, drops back into a home environment not one whit better than when he was removed from it, and most of the benefits of his expensive preventorium care speedily become dissipated. The

root of the trouble—an active case in the family circle—has remained untouched; the problem tackled from the wrong end.

Expensive—But Benefits Limited to Few

Finally—and foremost—many investigators are coming to feel that while the preventorium (in its old-fashioned sense) may be mildly beneficial to the child, it is a questionable investment for society in that it is not the most effective use of the funds. Preventorium care in Wisconsin costs from \$12.00 a week up. A year's care of a child with infection but not disease therefore costs at least \$625.00. At an average stay of one year, 30 such children could be cared for each year in a 30-bed institution (which is probably the maximum size that can be built for \$50,000.00); at an average stay of six months, 60—in either case at a yearly maintenance cost of approximately \$20,000.00. By the 1930 census, Marathon County had 24,552 children under 15 years of age. On the basis of tuberculin skin reactions found by the Wisconsin Anti-Tuberculosis Association, in some 25,000 tests over the state, Marathon County may be estimated to have approximately 2,000 children who have been infected with tubercle bacilli. Only some 60 of these, we see, or three per cent, could be given preventorium care (in its usual sense) in a single year; the rest would get nothing from the funds expended for the construction and maintenance of the preventorium, *not even diagnostic study to see whether anything was needed.*

In short, then, this is the indictment of the traditional type of preventoria now made by many public health workers: expensive care of dubious value for the few, nothing whatever for the many. This may, of course, be an extreme and sweeping point of view; preventorium care, even of the conventional type, still has its advocates.* In certain cases, where parents absolutely refuse sanatorium care and cannot be educated to maintain sanitary standards, protracted preventorium care for the children may not only be justified, we believe, but recommended. Even here, however, every effort should first be made, through intelligent public health nursing or social service, to get the active case isolated, and to raise the standard of the home; and rather than preventorium care, a good foster home should, we feel, be sought.

All in all, a preventorium of the traditional type, built and designed primarily for treatment, appears to have but limited and somewhat questionable value today. A few years hence, it may quite conceivably become a "white elephant" on the hands of Marathon County.** This would, indeed, be an unhappy issue of Mrs. Willard's bequest, and a memorial we would all regret. It

*In the Prendergast Preventorium, in Boston, perhaps the most conspicuous example of a successful preventorium of the traditional type, much of the success is attributed to its out-patient social service program—a feature most old-fashioned preventoria completely lack.

**In this connection, it may be noted that while Wisconsin has a continuous waiting list for adult beds, in spite of a declining death-rate and continually augmented capacities, children's beds in the preventoria and preventorium sections of our sanatoria show vacancies right along.

would seem to us, therefore, that an obligation rests on everybody who is, directly or indirectly, a trustee of the Willard funds to try to work out a program which embraces the preventorium idea, in accordance with Mrs. Willard's wishes and will, but designed in such a way as to avoid the traditional faults and shortcomings of the old-style preventorium. The key to such a solution, we believe, lies in a somewhat liberalized interpretation of the term "preventorium"—not as an institution built and equipped primarily to *treat* children (as formerly conceived), but rather to *study, diagnose and guide* them into the proper channels for whatever treatment, if any, is needed. Such a possible program is presented below under III.

II. Improved Physical Set-up for Mount View Sanatorium

Suggestions, we understand, have been made that part, or perhaps all of the money, be devoted toward improving the physical set-up of Mount View Sanatorium. Surgical facilities have been mentioned as a crying need of the institution, a central heating plant, etc.

We of the Wisconsin Anti-Tuberculosis Association feel that such a diversion of the Willard bequest would be both unhappy and unwise. We do not deny the need for improved physical apparatus at the sanatorium. But this is a need that should be met by the taxpayers of Marathon County as a matter of course. We feel confident, too, that the taxpayers will willingly meet these needs if properly presented to them. To "plough under" the splendid gift of Mrs. Willard in routine capital equipment would not only be contrary to the spirit and intent of the gift, we believe, but it would prevent the development of other and much needed work in line with the terms of the bequest—that is, treatment and cure of tuberculosis among children, and it would have, too, we fear, an effect that none of us would like to contribute toward—the discouragement of other prospective donors not only in Marathon County but elsewhere in Wisconsin and the nation from similar generous and high-minded gifts.

III. An Alternate Program: A Preventorium Unit With Out-Patient Service

By the terms of the will, a preventorium of some type is called for. Now the word "preventorium" means an institution to *prevent*—tuberculosis, that is. The word "sanatorium" means an institution to *cure*—tuberculosis. We believe that any program of *prevention* should embrace not merely a favored 30 or 60 children each year, but all, if possible, of the 25,000 Marathon County youngsters under 15. *Domiciliary* care for these 25,000 is out of the question. Nor is there reason for it. But *diagnostic* attention is possible for all of these 25,000 children or at least the 17,000 between five and 15 who go to school. Under the terms of the Willard bequest, we believe it is possible for Marathon County to set up and maintain a far-reaching and notable tuberculosis *prevention* campaign among *all* its children.

This would center around a "preventorium" nucleus—not a "preventorium" in its old-fashioned sense of a treatment institution but rather in the more modern sense—a clearing house for the study and guidance of cases. We do not propose rejecting the preventorium idea; what we propose is to bring it into conformity with 1936 knowledge and technique in the field of childhood tuberculosis. In other words, not a preventorium in its old, narrow sense; rather a preventorium in an up-to-date, scientific sense.

The "Screening Method"

A simple and relatively inexpensive technique is available today for finding early tuberculosis among large groups of apparently healthy youth. This is commonly known as the "screening" method. Each child or young adult is given a tuberculin skin test on the forearm. In the hands of a skilled physician, and when the children are lined up by a nurse or social worker who keeps needles sterilized, each test requires less than a minute. At the end of 48 hours, the tests are read. If tubercle bacilli have entered the body, a reaction in the form of a reddened area appears, disappearing a few days later. The test is entirely harmless and generally causes the patient less discomfort than a vaccination.

If the reaction appears, it means simply that *tubercle bacilli have entered the body*. An X-ray of such a child's chest reveals to the experienced eye of a tuberculosis diagnostician the scarred field of an old battle between, on the one hand, the forces of tuberculous disease, the tubercle bacilli, and, on the other hand, the resistive forces of the body. In the great majority of cases, the body wins. The bacilli gain the toe-hold known as "infection," but they are unable to do anything more.

Disease *may*, however, be present in addition to infection. The tuberculin test does not tell. The X-ray, properly taken and read, and correlated with other study and findings, *does* tell. Every positive reaction, therefore, particularly among children and young adults, should be followed by an X-ray of the chest to see whether any disease is present in addition to infection.

Studies done by Wisconsin Anti-Tuberculosis Association physicians on thousands of Wisconsin children indicate that 10 to 25 per cent of all high school youngsters in this state are reactors. Since tuberculosis infection is the absolute pre-requisite for tuberculous disease, and since the tuberculin skin test, properly administered, is an almost infallible indicator of tuberculous infection, the remaining 75 to 90 per cent may therefore be "screened" out as needing no further diagnostic study for the time being. (A year later, or two years later, of course, another skin test should be done on children who fail to react.)

X-Rays for Positive Reactors

The 10 to 25 per cent who react should have an X-ray of the chest to determine whether any damage is present. In the majority of these, as stated above, the disease is apparently "stopped dead." Such children usually need nothing more than an occasional check-up by

X-ray, and, of course, normally intelligent parental supervision.

A minority of the tuberculin reactors will need intensive diagnostic study—temperature and pulse study, urinalysis, blood sedimentation, serial X-rays, repeated physical examinations, animal inoculations, sputum tests, *etc.*, in order to demonstrate or disprove the presence of tuberculous disease. Some few will be found with active disease of the "adult type"; for these, sanatorium care in a children's unit of a sanatorium is advisable. A larger number probably may need a supervised family and school life, possibly in a foster home, with periodic check-ups. Whenever a child comes from a home having as one of its members an active case, *that case should be segregated, if possible, in a sanatorium, not the child in a preventorium*. Sanatorium care is beneficial for the curative effect on the patient; but far more important is its preventive value in isolating the carrier of infection and his education in sanitary precautions.

Recommended: (1) A Case-Study Unit

We therefore recommend that part of the Willard bequest be spent for the construction and equipment of a preventorium unit at the Mount View Sanatorium, with not more than 12 beds of the observation hospital type. Such a unit could well be serviced by the present medical, X-ray and laboratory facilities of Mount View Sanatorium. A unit of this type—purely for case study, cases then to be referred either to the sanatorium itself, to a hospital, to a supervised home, or whatever it may be—should cost not more than \$25,000.00.

Recommended: (2) An Out-Patient Program

The balance of the bequest we would recommend be set up as a Lee M. Willard Fund, the interest and principal of which is to be spent on an out-patient service connected with the study and guidance unit. The two, in fact, would be but halves of the whole. We would suggest that the entire sum be budgeted to finance a 15-year tuberculosis-prevention demonstration in Marathon County, a certain definite amount, with accruing interest on the balance, to be spent each year. A budget of \$3,000.00 a year should pay for a program of tuberculin testing, to be done with the co-operation of the Marathon County Medical Society, the State Board of Health, the Wisconsin Anti-Tuberculosis Association, or all three, in schools throughout the county, including the city of Wausau, new pupils being tested each year as well as non-reactors of previous years; for X-rays of positive reactors; and—not least—*hospital social service*, to get active cases out of the home and into the sanatorium, to educate the parents to the particular needs of their children, to secure periodic check-ups, *etc.* We believe that a trained home visitor, devoting her full time to visits and case work on tuberculous families, could accomplish far more toward *preventing* tuberculosis by uncovering active cases and safeguarding infected but not diseased children than a dozen of the old-type "preventorium" beds.

Such a plan should, of course, be worked out carefully by a committee representing local medical men and

civic organizations as well as representatives of the sanatorium and the state and local tuberculosis organizations. Above all, we would urge that no absolutely inflexible program be established; rather that a tentative working schedule be set up and followed, with a definite provision for a fresh appraisal of aims, methods and results after a five-year interval. Concepts may change in the future as well as in the past.

Summary

In short, then, this is the recommendation of the Wisconsin Anti-Tuberculosis Association: (1) that the entire bequest should not be spent for a treatment building alone—a building which even now would have but limited value, and might in the near future become a "white elephant"; (2) that the money should not be swallowed up in capital improvements for Mount View which can and should be obtained as routine appropriations for the operation and upkeep of the institution; but that rather (3) it should be spent in a unique and forward-looking adventure in *prevention*, rather than treatment. In accordance with the terms of the bequest, as well as the needs of Marathon County, the latter plan would entail some expense for a small preventorium unit for study and guidance of cases, but only for one-third to one-half the amount of the fund. The remainder would be set aside for *endowing* or at least *financing* the employment of human intelligence in finding and preventing tuberculosis in a program closely correlated with and centering around this preventorium unit. As one writer has well said, "Endowed brains can adapt themselves to changing needs; brick and mortar cannot."

Such a program, we readily grant, cannot be as easily conceived, planned or carried out as the building of a preventorium on conventional lines, or the use of the Willard funds for capital improvements at the sanatorium. But it is a venture that would bring attention to Mount View and Marathon County throughout the country for far-seeing and statesmanlike planning. And it is a program, too, that would constitute a unique and enduring memorial to the high life and generous mind of Dr. and Mrs. Willard.

Addenda

I

In connection with the present discussion and with particular reference to footnote on page 140, the following quotation from a paper presented at the 1935 National Tuberculosis Association annual meeting, "Are the Preventorium and Summer Camp Worth While?"* by Dr. J. B. Hawes, II, of Boston, Mass., is of interest. Dr. Hawes is president of the Boston Tuberculosis Association which operates the Prendergast Preventorium—an institution which has attracted attention as perhaps the most successful preventorium of the traditional type.

"I feel, therefore, as a result of these two surveys and an intensive study of the situation necessary for me in the preparation of this paper, more strongly than ever that the preventorium and the summer camp are dis-

tinctly worth while and that they afford one of the most potent means of education at our disposal, providing always that it is not merely the present health of the child that we are striving for but rather the condition of that child five, ten or more years afterwards and indeed for the rest of his life that the preventorium and summer camp is concerned with. Miss Billings once asked me how long after the child's discharge should he be kept under supervision and receive periodical examination. 'Until the child dies of old age,' was my quite proper answer.

"If every summer camp and every preventorium will maintain this attitude and will insist that the six months' or year's stay at the preventorium or two to three months' stay at the summer camp means also that the nurse or follow-up worker goes into the child's home, takes active measures to remove the source of infection, sees that the other children are examined, instructs the parents in home hygiene and sees that after discharge these lessons are continued, no one, I am sure, will possibly doubt their educational value in our campaign against tuberculosis."

II

In the May number of the *Hoosier Health Herald*, Dr. Paul D. Crimm of Evansville, Ind., the retiring president of the Indiana Tuberculosis Association and superintendent of Boehne Sanatorium, makes some interesting comments on the use of hospitals or preventoria for the care of children with fully calcified and inactive lesions in the lungs. He says, "A preventorium caring for children with inactive disease for a period of six months to two years is an institution spending money without doing much good for the prevention of tuberculosis. In the last analysis, they are only running a hotel for under-privileged children, which is, of course, commendable, but not far enough reaching in our campaign against this disease. In my experience, most of the children between the ages of five and 15 who enter these preventoria are apparently arrested, or nearly so, before they enter the institution.

"I know intimately a preventorium which existed from 1929 to 1933 and during this five-year period admitted and discharged only 287 children. In 1934 the same preventorium was turned into a diagnostic and educational institution where the average length of stay was 30 days, and from 1934 to 1936 (a period of two years) 835 children were admitted and discharged. Fifty per cent of these children had a primary infection, or childhood tuberculosis. So far none of these children have ever been returned as a case of active pulmonary tuberculosis. Educational interest aroused in the minds of the parents who had children in this institution, and educational follow-up work among both parents and children should prevent them from returning to some sanatorium later in life between the ages of 15 and 35."*

POSTSCRIPT—At this writing it appears that the end sought by the Wisconsin Anti-Tuberculosis Association

*Transactions of National Tuberculosis Association, 1935.

*Bulletin of the National Tuberculosis Association, August, '36.

—the setting up of a major portion of the fund for a case-finding and follow-up program among the APPARENTLY HEALTHY but tuberculosis-infected children of the entire county—has been lost. A brick and mortar program has been decided upon, embracing a 20-bed preventorium unit, a much-needed surgical division for the sanatorium, and a central heating plant to service the sanatorium, preventorium and nurses' home. By present architect's plans, little if any money will, therefore, be available for out-patient work.

Fortunately, a small rather than a large preventorium structure is being planned. Fortunately, too, the architects—aware of the growing change in scientific viewpoint toward the efficacy of old-fashioned preventorium treatment—are drawing their plans so as to make the unit adaptable in the future, if desired, for patients with adult type pulmonary disease.

A small achievement, perhaps. But to build a house takes a few months; to build a new concept in people's minds, many years.

Teen Age Tuberculosis*

S. B. Kalar, M. D.**

Ames, Iowa

THE interest of the National Tuberculosis Association in school health work is based primarily upon the accepted conclusions of Pirquet, Calmette, Opie and others to the effect that tuberculosis infection, to a large extent, occurs in childhood, the incidence rising with age up to adult life, when from 50 per cent to 95 per cent of the population may be infected.

Coupled with this hypothesis is another, that anything that increases or maintains the normal resistance of the child will help to prevent a breakdown with *active tuberculosis* later in life.

Most deaths from tuberculosis take place between the ages of 15 and 45. It is a mistake, however, to suppose that tuberculosis is an adult disease. These deaths in adolescence and adult life are the harvest of a disease which has been planted years before. Dr. W. L. Rathbun says: "In our high school and junior high school students, one-half of the cases of pulmonary tuberculosis have signs of latent childhood tuberculosis. This childhood type of tuberculosis is found in only between three or four per cent of the total school population in our country, which means that 50 per cent of the cases of pulmonary tuberculosis developing during the 'teens' is in this small group." He further says, "I believe that 75 per cent of the potential cases of pulmonary tuberculosis that will develop the disease during, or just before the 'teens,' are included in a group of children comprising those with childhood tuberculosis, their brothers and sisters, and other known contacts without demonstrable signs of the disease."

In a radio talk under the auspices of the Chicago Tuberculosis Institute, Dr. S. Sinclair Snider, associate member of the Chicago Pediatric Society, said, "The point deserving particular emphasis is that most of the *adult type of tuberculosis during the 'teen age'* and accompanied by such a high mortality rate is going to occur in that group of children that come from a tuberculosis environment."

*Read at meeting of Iowa Tuberculosis Association, Ft. Dodge, Iowa, March 19, 1936.

**Department of Hygiene, Iowa State College.

Tuberculosis is not a swiftly attacking and a swiftly receding disease. Tuberculosis is usually long-lasting and chronic. Tuberculosis is a *contact*, an *environmental* disease. To prevent deaths from tuberculosis, attention must be paid to the "seeding-time," which is usually the early years of childhood.

Children living in a home where a careless person has tuberculosis are in unusual danger because they are almost continuously exposed to large "doses" of tubercle bacilli.

When a moderate number of tubercle bacilli are taken into the lung for the first time, the infected person has few or no symptoms, and the tubercle bacilli are finally imprisoned in the glands located around the larger bronchial tubes. This type of tuberculosis is called the first infection type; or, since the first infection usually takes place in childhood, it is also called the childhood type of tuberculosis. Following such an infection, the average child enjoys a period of good health. Lime salts are gradually deposited in the infected glands and the X-ray film shows these glands to be calcified. Living tubercle bacilli have been found in glands that have been calcified for 10, 20, or even 30 years.

After an individual has passed the adolescent period, calcified lesions in the lung are evidences of an old tuberculous process that has probably healed. Calcified lesions in children, however, indicate tuberculous disease; and children with this condition need careful supervision until the years of adolescence have passed and healing is assured. Much can be done to strengthen a child's resistance so that he will not develop a serious lesion. A periodic check-up on his health will help to safeguard him against the tragedy of learning some day that he has a lung disease well established before any symptoms have appeared.

After a period of quiet as far as activity in the glands is concerned, many persons develop tuberculous infection, not in the glands, but in the lung itself. This type of lung or pulmonary tuberculosis is called the adult type, since it usually occurs in later life.

It is all too common when search is made by school physicians in high schools and colleges to find students with beginning adult type of tuberculosis playing on the football or basketball teams. This is a dangerous situation because the symptoms, if present at all, may be so slight as to excite no alarm. As a result of indifference, the disease is allowed to progress to a serious stage. A case of early tuberculosis treated promptly and adequately has an excellent chance of getting well, but once the disease is entrenched it is difficult to cure.

There are three very important facts about tuberculosis of boys and girls of high school and college age.

First. The infection is very apt to develop insidiously, to creep up on the boy or girl; and by the time the individual shows symptoms of disease such as cough, expectoration, fever, and loss of weight, the disease process may be advanced and cure is difficult. Cases have been reported in which the X-ray showed a gradually developing lung process for seven years before the child showed any symptoms of infection.

Second. Perhaps because it is usually discovered late, or perhaps because boys and girls of high school and college age lack resistance to tuberculosis, the death rate among those developing the adult type of tuberculosis is very high. In 1900, the mortality tables for all ages showed that tuberculosis caused more deaths than any other disease. In 1930, again considering all ages, tuberculosis ranked *seventh* as a cause of death. However, if we consider the ages between 10 years and 35 years, tuberculosis *still ranks far above any other disease.*

The seriousness of the adult type of tuberculosis can be seen from the fact that out of 110 children found by the Massachusetts Department of Public Health in its school clinics to have this form of the disease, 23 per cent were dead within three to seven years.

Third. The disease is more frequent and the death rate much higher in adolescent girls than in boys of the same age. The Massachusetts study has shown almost three times as many girls as boys with this type of disease. A further study of the Massachusetts survey and the Massachusetts death rate shows that *one* out of every *three* young women, who die between the ages of 15 and 30, dies of tuberculosis.

The conclusion that the spread of tuberculosis in the community is in great part the result of slowly progressive household epidemics, which often transmits the disease by contagion from one generation to another, seems rather well established.

Tuberculosis being a contact, *an environmental disease*, it has occurred to me that the much *closer contact* in the *family* of the girls who are confined to the house, assisting with housework, coming in frequent contact and helping care for tuberculous (often not known to be tuberculous) members of the family, thus exposed to continuous "doses" of tubercle bacilli, while the boys of the same household are out of doors or away at work, might be a factor in the greater frequency of the adult type of the disease, and the higher mortality rate in the 'teen age' girl.

In our state of Iowa, during the decade 1921-1930, deaths from tuberculosis numbered 10,045. In 1934, there were 619 deaths from tuberculosis, which means that in 1934 there were nearly two deaths per day. If, as has been shown, there are nine active cases of tuberculosis for each annual death, these 619 deaths in Iowa in 1934 mean that we have 5,571 active cases. Iowa has 696 beds for tuberculosis. Deducting 696 from the 5,571 active cases, we have 4,875 active cases, many of whom no doubt are living in families with children. Many of these active cases are probably not even recognized as tuberculous, and all of them are potential infectors of our youth.

During the period 1928-1932, among Iowa children of high school age, there were—

217 deaths from tuberculosis.

108 deaths from influenza.

28 deaths from epidemic meningitis.

27 deaths from purulent septicemia.

19 deaths from scarlet fever.

77 deaths from *all other diseases.*

This totals 492 deaths, of which 217 were from tuberculosis. Thus, from this quite recent report covering a five-year period, we find that tuberculosis caused *nearly one* out of every *two deaths* from Iowa children of high school age.

Such figures as these from the Massachusetts Department of Health and the Department of Health of Iowa, are rather terrifying and lead us at once to consider the problem of prevention.

Perhaps the greatest single weapon that has been given us in the last few years in our fight against tuberculosis has been the general use in large groups of more adequate methods of early diagnosis and case-finding. This has been accomplished by tuberculin testing and X-raying.

It is no longer necessary for us to speak in a vague way about the tuberculosis problem in a high school in a certain district in our community. We can go into that school and in a few days or weeks tell exactly how much tuberculosis there is in it. We can locate the homes where there are open cases, and can locate the infected contacts. We have, in fact, a simple way to unfold the complete picture of tuberculosis in this group.

One of the first contributions on this subject was a survey made in Philadelphia by the Phipps Institute, three years prior to 1929. They found in the age group 14 to 19 years of age, of 1,422 white children tested, 83 per cent were tuberculin positive, and of 1,066 positive reactors 3.6 per cent showed latent or active infiltrating lesions of the lung parenchyma in the X-ray. In a survey of school children in Massachusetts in 1926, Chadwick found one per cent infiltrating lesions in 877 children age 14 to 15 years. More recent figures from the Red Book area in Brooklyn show that out of 1,325 white children age 15 to 19 years, X-rayed with paper films in 1933, .8 per cent showed important tuberculous lesions.

These figures indicate that on an average we can expect to find one per cent to three per cent of serious tuberculosis in children of high school age.

Dr. Lee H. Ferguson reports that in a survey made in high schools of Cleveland, 35 per cent were found to react positively to tuberculin.

In the age group 15 to 19 years in Cleveland in 1933 were approximately 83,571 white children and the Health Station records 435 cases, or 0.5 per cent of pulmonary tuberculosis.

Dr. Ferguson says, "As it does not seem probable we are getting more than one-half to one-third of the cases, we can safely say that in our white high schools in Cleveland about one per cent to 1.5 per cent have serious lesions at the present time."

In the fall of 1933, the tuberculosis committee of the American Student Health Association conducted a survey of tuberculosis and tuberculin testing in 11 institutions of the United States. Out of seven institutions having an active tuberculosis program, the incidence of tuberculosis varied from three active cases per 1,000 to 13 cases per 1,000. The average for the entire group was 6.7 active cases of tuberculosis per 1,000. Of all the institutions reporting, Minnesota can be taken as most typical. Here they have had a program, including tuberculin testing and X-raying for several years. In 1932-33, the results of tuberculin testing showed 25 per cent positive reactors, and they found 4.3 cases of adult pulmonary tuberculosis per 1,000.

Since 1931, the University of Michigan has carried on a yearly tuberculin testing of all freshmen women, and all women students with positive skin tests have had the chest X-rayed. An average of about four active cases of pulmonary tuberculosis per 1,000 has been found each year among the entering women students.

The east has a more serious tuberculosis problem than we of the middle west. In all probability there will be great variations in these percentages, depending on the locality in which a survey may be made, but these figures are sufficiently accurate to show that we have a very definite and serious menace from tuberculosis at the high school age. We are carrying over into colleges

exactly the same problem which we face in the high schools and I fear that we are not meeting it adequately in either place.

It is well recognized that early cases of pulmonary tuberculosis often give no symptoms or physical signs and that diagnosis of the disease in a stage favorable for treatment depends to a very great extent upon the widespread use of X-ray facilities.

Dr. David Zacks, in a report on pulmonary tuberculosis in adolescence in the ten-year program of Massachusetts, says, "The X-ray is the most important single factor in the discovery of tuberculosis in the 'teen age.'"

Dr. Zacks also states that r les, on the average, appeared 2.6 years after the lesion had been demonstrated by the X-ray. Cough and expectoration appeared on the average, three years after the X-ray evidence.

In an article entitled "Value and Limitations of X-ray in the Diagnosis of Chest Diseases," THE JOURNAL-LANCET, April 1, 1935, Dr. J. Arthur Myers says, "Obviously, the X-ray film cost must be reduced to about the same basis as ordinary laboratory work so that it can be figured as a part of a general examination without materially increasing its cost. Periodic films of the chests of *apparently healthy persons*, for the purpose of identifying unrecognized cases, are absolutely essential to the rapid control of tuberculosis in this country."

It seems to me that the foundation for the solution of this menace to our youth is to be found in a wider dissemination of accurate knowledge of tuberculosis.

We need the co-operation of the parents in the home and this must be obtained by education. School doctors should have better training in this disease; teachers and nurses in their training courses must be given modern concepts of tuberculosis; hygiene courses in schools and colleges must be planned so as to interest our pupils in tuberculosis as an individual and community problem. Add to this an active program of tuberculosis testing and X-raying in our schools and colleges, together with a close follow-up on all cases, and we have at our disposal the means necessary to save the terrific toll which tuberculosis takes in this group of 'teen age.'

The Human Factor*

In the Control of Tuberculosis

L. E. Smith, M.D.

Louisville, Ky.

CONTROL of tuberculosis is within our reach. Its accomplishment does not depend upon the discovery of some perfect remedy capable of working magic in therapeutic realms. Neither does it depend upon some wonderful procedure capable of hedging our children about with a resistance invulnera-

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ble to the tubercle germ. It does, however, depend upon the acquisition of certain fundamental facts and the intelligent application of fundamental principles of disease prevention and health promotion.

It is not within the scope of this article to discuss or review the history of tuberculosis. Neither is it intended to review progressive developments in the treatment of

the disease. Our purpose is rather to point out some of the reasons why we have not done more to bring this controllable, preventable, and curable disease completely under our control.

As far back as we are able to find reliable records of human achievements, the devastating effects of tuberculosis stand out with appalling significance. Whether it was called the "white plague," the "consuming disease," "consumption," or by its more modern name, "tuberculosis," makes little difference, because it has remained the same destructive human enemy, respecting no age, but attacking all ages as well as all ranks of people. While the hovel and the homes of those living on lower economic levels have suffered most, yet this disease has been called the plague of kings. It has wrested crowns from the brows of monarchs as well as paled the cheeks of beautiful queens. Truly it has been, and is now, "no respecter of person."

Some 2300 years ago, a great Greek physician, the father of medicine, called attention to the treatment best-fitted to the victims of tuberculosis. He prescribed a tent on a mountain side, a goat and rest. This meant quiet isolation, fresh air, good food and rest. More than 20 precious centuries passed and millions of lives were sacrificed on the altar of ignorance, indifference, carelessness and neglect before the value of rest, as the outstanding factor in tuberculosis control, was demonstrated and accepted in this country.

During the dark periods of human history, disease was looked upon with terror and interpreted as a form of punishment visited upon its victims by Providence for disobedience to divine law. The human race was groping helplessly in the dark and crying out to the deities of its many races and tribes for relief from devastating plagues and sundry ills which were destroying countless numbers from year to year.

Tuberculosis was not among the spectacular diseases of this dark and terrible period. It was a slow-moving epidemic, taking heavy toll of human life and leaving the blight of disease upon friends and associates of its victims. Perhaps it was this phase of the disease that led Hippocrates to note that it was a family disease and, no doubt, to the conclusion that tuberculosis was inherited.

Almost 20 centuries have passed since the Galilean Physician spoke to a group of his followers in these precious words: "Ye shall know the truth and the truth shall make you free." And yet we find that only a small portion of our people today have learned, and applied the great truth concerning the way of life.

More than 50 years have gone by since the pioneer in the epidemiology of tuberculosis gave the medical world the fundamental principles essential to the control of tuberculosis. His was no guess work, for Dr. Koch had so thoroughly worked out the problem that his postulates are still considered outstanding landmarks in the epidemiology of the "white plague."

We might recount the various steps taken by many other scientists of note as they added their contributions from year to year. The facts as to them, as well

as to the modern methods of preventing, finding, controlling and treating tuberculosis, are common knowledge. We are also familiar with the great decline, in recent years, in the death rate from tuberculosis, and are often led to believe tuberculosis is no longer a major problem. When we examine the figures, however, we find a different story.

In looking over the records in Kentucky we find 2,010 deaths from tuberculosis in 1935. Tuberculosis stood fourth from the top of the list as a taker of life, but it occupied second place in the list of preventable diseases. When we analyze the deaths, between the ages of ten and 50 years, due to the four leading causes in Kentucky during 1935, we find that tuberculosis was responsible for 1,213 of them. Accidents, with 974 deaths, comes next; heart disease, with 720 deaths, is third; and pneumonia, with 550 deaths, follows. So, in Kentucky, after all these years and in spite of all our knowledge, tuberculosis is still "Public Enemy No. 1."

Does this distressing situation exist today because we are powerless to change it? Have we been misled in considering tuberculosis a preventable disease? Is our slogan, "No Tuberculosis Without the Tubercle Bacillus," untrue? Have we been in error when we considered tuberculosis to be controllable? Are we wrong when we say, in the face of the tremendous tuberculosis death figures, that tuberculosis is curable? The answer to all these questions is "No."

Dr. E. L. Bishop, director of health, Tennessee Valley Authority, said, in a recent address before the Kentucky Conference of Social Workers in Louisville:

In the opinion of a conservative epidemiologist, the ultimate conquest of tuberculosis is quite within our grasp, provided the present rate of interference with transmission can be accelerated by more complete application of methods now known.

This statement contains much food for thought. It places the responsibility squarely on our shoulders. The goal of tuberculosis control is within our reach, provided we persistently and intelligently use the dependable material and tested methods now available.

Perhaps we are not going too far when we admit that after all these years tuberculosis is still "Public Enemy No. 1"; not because we have failed to find a specific remedy; not because we have failed to find the long sought for immunizing agent capable of fortifying possible victims of tuberculosis against the possibility of infection; not because we are not able to provide sufficient sanatoria to furnish the required one bed per death; but because we have failed to do what could have been done with the equipment available to us. We have failed because the human factor in the control of tuberculosis has inadequately utilized the available material and forces against our great enemy.

Fear is an element that plays a large part on the human side of tuberculosis control. It prevents many from informing themselves concerning this disease. They think of it as if it were a family trait inherited from their unfortunate ancestors. They speak of it in a whisper, lest someone should hear them and spread per-

nicious gossip among their neighbors. They assure physicians, social workers and representatives of health organizations that there is no tuberculosis in their families and stubbornly refuse to permit the use of any tests or measures designed to reveal the presence of tuberculosis. They usually wait until they are clinically ill before they come to the physician for help, and then they are often in the advanced stages of tuberculosis.

Dr. John B. Naive, of Knoxville, Tennessee, recently reported 37 patients, 20 years of age and under, entering Beverly Hills Sanatorium within a two-year period. Of these, 22 were far-advanced; 12 were moderately-advanced, while only three were incipient cases. Thirty-four of these patients (all but the three early cases) had tubercle germs in their sputa at the time of admission. Thus we see that 34 out of 37 cases were spreading infection among their associates long before they came under competent care.

We are familiar with the difficulties confronting us when we attempt to apply modern methods in tuberculosis control to the masses, and yet we can never hope to approach our goal of tuberculosis control any other way. Often when tuberculosis is found early, the physician is handicapped because the frightened patient, or some member of the family, utterly refuses to co-operate or even permit adequate treatment to be given.

Education will open the eyes of the ignorant masses, and, as the story of health and the possibilities of tuberculosis prevention, control and treatment is told to them in a language they can understand, they will embrace it with open arms, for they, too, want to live. The light of facts will banish fear.

Selfishness is another element capable of blocking a tuberculosis control program. Since much of our tuberculosis is found among those who live on the lower economic levels, tuberculosis control programs are often hindered, and at times prevented, because of inadequate funds.

Those who are interested in seeing tuberculosis controlled find it necessary to persuade taxpayers and officials that funds used for this purpose are legitimate expenditures and will guarantee ample returns by reduction of taxes for the care of orphans, indigents and institutions, as well as make life safer for those not yet infected. Physicians must be ever conscious of their dual personalities. They are physicians when duty calls, but citizens always. When acting in the capacity of citizens, professional ethics should not prevent them from discharging their duties of citizenship to the fullest extent.

Indifference often plays more than a minor role in obstructing tuberculosis control programs. Those with a meager knowledge concerning the early symptoms of tuberculosis are apt to pay little attention to the warnings voiced by health workers and social agencies interested in the early diagnosis and treatment of tuberculosis. Again, it is quite natural for those who are not familiar with the infectious nature of tuberculosis to ignore all pleas for adequate protection from the spread-

ers who are constantly sowing the seed of death among their companions.

Indifference on the part of some practicing physicians is often a hindrance to tuberculosis control. After more than 20 years of intensive education and in spite of all aids to early diagnosis available to the profession, we still find that too many of our cases are diagnosed after delays of months, or even years. There can be but little, if any, reasonable excuse, other than failure of the patients to consult physicians early, for delay in early diagnosis of tuberculosis. To overcome this difficulty, health officials, educators and laymen have joined hands in a great campaign to educate the public to the significance of the danger signs of early tuberculosis and to emphasize the importance of consulting the physician early. An educated public will consult physicians early, and up-to-date physicians will use all available methods and equipment to detect the presence of tuberculous infection, as well as clinical tuberculosis, at the earliest possible moment.

Ignorance contributes much to the defeat of many tuberculosis control programs. When people know, they are apt to think. When they think, they usually act; and action is what really counts. It has been wisely said, "Knowing what to do, is knowledge; knowing how to do it, is skill; and DOING IT, THAT IS SUCCESS."

We are not so much in need of more knowledge, but we do need to apply, intelligently and in the fullest possible measure, the knowledge we now have in the wise solution of our tuberculosis problems.

The great gap between what we know and what we do, should be closed up.

The National Tuberculosis Association was organized in 1904, in an effort to close this gap. State and local associations were organized everywhere. An enlightening educational program was launched on a large scale.

In suggesting briefly a valuable tuberculosis control program, in the light of present day knowledge concerning tuberculosis, we may assume that our states and communities have effective organizations, and that vital statistics are available for intelligent use in convincing the public of the significance of the tuberculosis problem. We may also assume that available literature for educational programs is widely and wisely used.

We are entirely within our rights in insisting that an adequate health educational program—that is, one adapted to the individual needs, be a conspicuous part of the regular schedule of every educational institution, from the kindergarten up to and through the university, with special emphasis on tuberculosis.

Every group should have adequate health supervision by a competent staff of workers. Tuberculin testing, X-ray follow-ups, home visitation, isolation and adequate treatment should be applied in a practical way and cover all the communities from which pupils are gathered.

Teachers, bus drivers, janitors, food handlers and all employees coming in contact with pupils should be proven free from infectious tuberculosis by the tuberculin test and X-ray. Examiners should always remember there may be no symptoms in early tuberculosis.

Family physicians should be the vitalizing force in such control programs. They are the guardians of health and should not hesitate to accept and discharge the responsibility placed upon them. They should be prepared to take charge of children in every case revealing the presence of tuberculous infection. They should recognize their opportunity to render valuable and lasting service by piloting infected children through the stormy seas of youth and adolescence, to the calmer waters of mature years, where discretion and intelligence should make the remainder of the voyage comparatively safe.

Physicians should ever be aware of the fact that all tuberculosis is serious. They should not forget that all those now filling consumptives' graves were at one time early cases. They should never be content until the source of every infection is located and treated. Isolation of spreaders should become a universal practice and every contact of every spreader should be sought for and treated. Physicians and health workers have a definite obligation to those found ill; they also have an obligation to society, and should not be content until both obligations are discharged in the most creditable manner possible.

There can be no effective tuberculosis control program without the co-operation of physicians. In the words of Dr. Robert B. Kerr of Manchester, New Hampshire:

The physician is not only a practitioner of the art and science of medicine. He is a citizen of the community in which he lives. He is almost always

an influential and respected citizen. He should be interested in the welfare of the community at large. He should be active in every proper procedure for the control and prevention of tuberculosis. Every movement for the prevention of disease and the promotion of good health, particularly among children, should receive his interest and support. The physician should be a teacher of preventive medicine. In his teachings he should always emphasize the importance of periodic health examinations even for individuals in apparent good health. He, more than anyone else, knows the tragic ending to physical conditions which caught early and treated could have been prevented.

The medical profession has always been the leader in all of the efforts for the prevention of disease and the betterment of mankind. In every such movement, the leadership and inspiration of some physician or group of physicians have always been the motive power behind it.

The responsibilities of the physician are many, yet not without compensations. To have saved life; to have prevented disease; to have eased human suffering; to have made the community in which one lives better because of one's presence and service there—all these bring to the physician lasting satisfaction.

To have been true to the ideals of his profession and to know that he has met in full his obligations for active participation in the cure and prevention of tuberculosis brings to the physician a reward beyond money and beyond price.

Sick, Broke and Footloose*

H. E. Kleinschmidt, M.D.**

New York City

AT LEAST one type of citizen in the United States stubbornly defies regimentation, classification, or control. He is the tuberculous transient who has come west seeking a climatic cure, exhausted his resources and now wanders from place to place on foot, on brake rods, or in a dilapidated auto. In jungles, shacks and flophouses he pauses when he must. He has lost his claim as a resident of the home town he deserted, and is not welcomed as a resident elsewhere, since he is regarded as a "bum" without visible means of support, but with a very visible need of relief. He is not, in the main, getting well of his consumption—salubrious climate notwithstanding. In many instances he is accompanied by his worried wife and half-starved children. Worst of all, he is a prolific sower of the seed that causes tuberculosis, for even the respectable, cautious resident cannot escape contact with

him directly or indirectly at the filling station, restaurant, tourist camp and lodging-house.

No census has been taken of tuberculous wanderers, but a conservative estimate, based on observations of transient officers, is that their number exceeds 1,000 in the states of Colorado, Arizona, New Mexico, Western Texas and Southern California. This number, however, includes only the obvious consumptives—obvious, that is, to the non-medical social worker. If a more thorough and precise case-finding search were made, including X-ray examinations, the army of indigent tuberculous in the Southwest would doubtless exceed 5,000.

The problem is an old one; at the very beginning of the tuberculosis movement the National Tuberculosis Association supported a vigorous "get-well-at-home" campaign because even then the distress of consumptives stranded far away from home called loudly for relief. The campaign succeeded only in small measure, so firmly had the magic of climate taken root in the mind, not

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**Director, Health Education, National Tuberculosis Ass'n.

only of the common man, but also the physician. Climate does have therapeutic value; but only as a supplement to the more rational treatment of rest, good hygiene and medical care. To sacrifice home comfort, economic security and decent care for the elusive promise of climate is more risky than hunting gold in Alaska.

Attention is again being focused on the plight of the tuberculous transient. This came about through the activities of transient shelters hastily set up by the Emergency Relief Administration three years ago in an effort to "freeze" the army of aimless wanderers. Naturally, the sick were separated from the well in these shelters, and soon it was found that about one-third of the sick were tuberculous. These were segregated in such special buildings as were readily available. In Nogales, Arizona, for example, an old military barrack used during the Mexican border dispute was utilized. Medical service was secured from the adjoining town, nurses were employed, and shortly "tuberculosis units" were running full-blast.

With make-shift equipment and labor drawn from among transients not too sick to work, these units performed a heroic and very creditable service. Some of them were almost completely self-contained; they sheltered patients, maintained a farm, killed and dressed their own beef, manufactured crude coffins and buried their dead. Social workers investigated each case carefully, returned some patients to their homes, placed the families of others in shelters, and in numerous ways helped to solve individual problems. Best of all, some 500 patients known to have tuberculosis in communicable form, were taken out of circulation, so to speak, and given at least the first essentials for recovery, namely, bed rest and nourishing food. The service cost averaged less than \$1.00 per patient per day. Perhaps no relief money was ever better spent, from a social viewpoint, than the thrifty sums contributed for the maintenance of tuberculosis units.

When, last fall, the time came for the Federal government to liquidate its transient service, consternation spread among the workers in charge of sick transients. There was no hope of transferring the activity to state or local budgets. No other alternative seemed open except to turn the sick out into the desert.

Fortunately, the fine work of tuberculosis units attracted the favorable attention of WPA officials. A small unexpended fund was found, and a temporary stay of the threatened demobilization was granted. At the same time, however, the intake of new patients was stopped, and only existing beds were continued.

In this emergency the National Tuberculosis Association, in the spring of 1936, called a conference in Santa Fé to consider the problem. Health officers, tuberculosis executives, and transient workers met for two days to analyze the situation. A representative of the United States Public Health Service was present and participated in the discussions. The complexity and imminence of the transient problem in general seemed at first so overwhelming that every measure proposed led to greater confusion. Very wisely, however, this group

decided to limit its consideration to the tuberculous transient as *a spreader of a communicable disease*.

Tuberculosis is undeniably a communicable disease and, as Disraeli said years ago, the first obligation of any government is to safeguard the health of its people. The emphasis was placed, not so much on the distressing need of sick individuals, as upon the opportunity of protecting the public in general.

Since a person with a communicable disease creates an inter-state problem when he crosses state borders, the consensus was that the control of tuberculosis among transients is a function the Federal government might perform better than the several states; but that the final responsibility for many of these cases must rest on the states from which the tuberculous transients come.

Whoever assumes the task of controlling the spread of disease through indigent transients, the question as to how this shall be done remains to perplex the most experienced health and social workers. Forcible detention is in bad odor—tuberculosis is not yet regarded by the public as seriously as leprosy, for example. Deportation to point of origin would not solve the larger problem and for some patients who have the fixed idea that their very lives depend upon living in this or that climate, it would be inhumanly cruel to send them home, wrong though they might be. To erect sanatoria in resort areas would result in luring persons from all parts of the country, and thus aggravate the evil. Families would come with them and, not being eligible as patients, would be dumped upon the mercy of social agencies in cities and towns nearby, already swamped with appeals from their own people.

One proposal made is that colonies be established in the great open spaces for entire families. But the states where they would be most likely to settle are least able to support such an enterprise and the Federal government can hardly be expected to finance it, at least not until the broad problem of transiency is tackled through sweeping legislation such as that proposed in the Trammell-Wilcox bill recently before Congress. Self-support of such a colony is a fatuous hope, and it seems unlikely that many families would consent to be herded together in that manner. And if such colonies, because of good management and by providing attractive living conditions should succeed, we would again be confronted by the problem of preventing the influx of families from all over the country who had better remain where they are.

At present the United States Public Health Service is studying the situation to see what facilities are available. The situation is probably not as hopeless as it might have been a few years ago. One advantage is that the country generally is now better equipped to care for its tuberculous residents near at home. Another advantage not to be had a few years ago are modern weapons that are now used to combat tuberculosis. Isolation of the carriers in sanatoria is, of course, the crux of the situation, but there are also new developments in diagnosis and treatment which make the control of tu-

berculous transients, even in the absence of adequate beds, more workable than some years ago. For example, collapse surgery enables the otherwise bed-ridden patient to carry on light work, and this treatment also renders him bacillus-free which means that he promptly ceases to be a danger to others. Fifty per cent or more of all tuberculous patients can be successfully "collapsed," and so-called ambulatory pneumothorax treatment is now an accepted procedure. There are furthermore better methods of case finding. It would not be Utopian to propose that all transients be X-rayed, which would lead to the discovery not only of obvious cases, but also of those in the earlier stages who by prompt action could soon be restored to health.

Meantime there is need for a vigorous educational campaign in areas from which most of the transients come, to point out the futility of bartering the chance

to get well for the flimsy promise of a climatic cure. The National Tuberculosis Association was enjoined by the Santa Fé Conference to lead such a campaign. Another necessary reform needed is the radical revision of state settlement laws. The present system is an archaic one, uncoordinated, chaotic, and often working unjust hardships on residents and newcomers. Among the groups giving attention to this problem are: the American Public Welfare Association, the National Committee on Care of Transient and Homeless, and the Continuing Committee of the Inter-State Conference on Transients and Settlement Laws.

"No home is safe until every home is safe," is an old slogan used by tuberculosis associations. Until we have come to grips with the tuberculous transient, we cannot hope to guarantee safety to the rest of American citizens.

Comparative Study of Tuberculosis Among Insane Persons*

H. E. Hilleboe, M.D.**

St. Paul, Minn.

SUCCESSFUL and permanent control of tuberculosis in state institutions in Minnesota is dependent upon the proper execution of two related procedures: First, routine examination for tuberculosis of all new inmates and employees by means of the Mantoux test and X-ray, in addition to the regular medical examination; second, careful supervision and medical examination at definite intervals of all known cases of the disease resident in the institution, and adequate isolation of the infective and potentially infective tuberculous inmates. Only by employing such methods routinely can the incidence of tuberculous cases and deaths be reduced. The purpose of this paper is to present results of the first procedure mentioned, the routine admission examination for tuberculosis of 1,566 persons committed to the three admitting hospitals for the insane at Fergus Falls, Rochester, and St. Peter during the calendar year 1936.

The Minnesota State Board of Control, which is responsible for the care of state wards, interested itself in a survey in the winter of 1934-35 to determine the incidence of tuberculous infection and disease as a preliminary step in the development of a permanent plan of control for all state institutions. This survey was carried out by the medical staff of the Minnesota State Sanatorium and resulted in the identification of several hundred cases of reinfection (or adult type) tuberculosis among the 15,994 inmates and 2,400 employees exam-

ined. Following this survey, the Division of Tuberculosis of the State Board of Control set up a system of admission and follow-up examinations which went into effect January 1, 1936.

The usual diagnostic procedures are employed in the examination for tuberculous disease of all newly-admitted persons. The Mantoux test (using old tuberculin) is applied and all positive reactors are X-rayed. The X-ray plates are interpreted by the medical staff of the State Sanatorium. This point is of importance in the comparison of the incidence of positive X-ray findings in the survey group and the group of patients admitted during 1936. All plates were read by the same group of physicians.

The material used for this comparative study has been obtained from two sources. First, the Mantoux test and X-ray results on 8,969 insane inmates who were examined during the survey of 1935; second, the Mantoux test and X-ray results on 1,566 insane persons admitted to hospitals for the insane during 1936. It is to be noted that the inmates examined in the survey had been in residence for different periods of time, and that no routine procedure for the diagnosis of tuberculous infection and disease was in force prior to the survey. Persons who recover from their mental disease frequently do so within a period of a year, and accordingly are discharged. The remainder of the inmates usually spend the rest of their lives in these institutions. Any comparison made between these two sets of data must be qualified by these facts. In other words, the second group represents the type of people who are

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**Director, Division of Tuberculosis, Minnesota State Board of Control, St. Paul, Minn.

TABLE 1

Distribution of Mantoux reactions and X-ray findings by age group and sex of 8,969 inmates of institutions for the insane, in Minnesota: 1935; 1,566 admissions to three hospitals for insane, in Minnesota: 1936.

		NUMBER								PER CENT									
		1935 Survey				Cases				1936 Admitted				Cases					
		Mantoux Test				X-Rays of Positive Reactors				Mantoux Test				X-Rays of Positive Reactors					
Sex	Age Group	Tested	Positive	1st Infection Type	Reinfection Type	Tested	Positive	1st Infection Type	Reinfection Type	Tested	Positive	1st Infection Type	Reinfection Type	Reinfection Type of Total Tested	Tested	Positive	1st Infection Type	Reinfection Type	Reinfection Type of Total Tested
MALE—																			
15-24		206	134	69	12	95	41	4	.....	65	52	9	5.8	43	10	.....	.....	.....	.....
25-44		1710	1506	799	166	361	238	37	10	88	53	11	9.7	66	16	4.2	2.8	.....	.....
45-64		2169	1954	1057	219	271	224	57	18	90	54	11.2	9.9	83	25	8.0	6.6	.....	.....
65-|— .....		909	742	383	113	182	106	17	10	82	52	15.2	12.5	58	16	9.4	5.5	.....	.....
Unknown		37	26	16	5	30	17	6	.....	.....	.....	19.2	.....	.....	.....	.....	.....	.....	.....
Total		5031	4362	2324	515	939	626	121	38	87	53	11.8	10.2	67	19	6.1	4.1	.....	.....
FEMALE—																			
15-24		133	90	43	9	80	31	7	2	68	48	10	6.8	39	23	6.4	2.5	.....	.....
25-44		1302	1085	566	149	237	144	27	11	83	52	13.7	11.5	61	19	7.5	4.6	.....	.....
45-64		1780	1518	811	182	180	130	38	8	85	53	12	10.2	72	29	6.2	4.4	.....	.....
65-|— .....		698	553	265	97	111	65	11	8	79	48	17.5	13.9	59	17	12.3	7.2	.....	.....
Unknown		25	19	6	3	20	12	3	.....	.....	.....	15.8	.....	.....	.....	.....	.....	.....	.....
Total		3938	3265	1691	440	628	382	86	29	83	52	13.5	11.2	61	23	7.6	4.6	.....	.....
BOTH SEXES—																			
15-24		339	224	112	21	175	72	11	2	66	50	9.4	6.2	41	15	2.8	1.1	.....	.....
25-44		3012	2591	1365	315	598	382	64	21	86	53	12.2	10.5	64	17	5.5	3.5	.....	.....
45-64		3949	3472	1868	401	450	354	95	26	88	54	11.5	10.1	79	27	7.3	5.8	.....	.....
65-|— .....		1607	1295	648	210	293	171	28	18	81	50	16.2	13.0	58	16	10.5	6.1	.....	.....
Unknown		62	45	22	8	50	29	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total		8969	7627	4015	955	1566	1008	207	67	85	53	12.5	10.7	69.0*	22*	7.1*	4.9*	.....	.....

*Corrected rates.

admitted to institutions for the insane having no selective factor other than that they are insane. The first group represents the same type of people with the exception that this group has definitely been in contact, both known and unknown, with cases of tuberculosis in institutions, besides any contact in their homes before admission.

Table 1 shows the distribution of Mantoux reactions and X-ray findings by age group and sex of 8,969 inmates of the institutions for the insane in Minnesota as found in the survey completed in the spring of 1935. Of the total number examined, 56 per cent of the persons were males, and 44 per cent females. The age groups were originally set up on the basis of ten-year groupings, that is, 15-24, 25-34, 35-44, *et cetera*. But it was found that certain of the age groups could be combined because of the fact that the incidence of positive reactors and positive X-ray findings did not differ greatly within the smaller groups. Four per cent of the males were in the age group 15-24; 34 per cent in the age group 25-44; 43 per cent in the age group 45-64; 18 per cent in the age group 65 years of age and over, and only one per cent were of undetermined age. The females are distributed in practically the same proportions as the males by age groups. This makes it possible to combine the data for males and females into one group for comparative purposes without distorting the distributions. It obviously would be unfair

to compare one group of persons in which 20 per cent of the cases were under 24 years of age, and 80 per cent 25 years and over, with another group in which 80 per cent were under 24 and only 20 per cent 25 years and over. Having similar proportions in similar age groups makes comparisons valid and reasonable.

The age group 15-24 was considered separately because of the interest that everyone has in this "teen" age and early adult age group in which the tuberculosis mortality rate is usually very high. The next age group used was 25-44; the next, 45-64; and finally, 65 years of age and over. It is interesting to note that several of the inmates in this last group were between 80 and 90 years of age. In the 5,031 male inmates who were tuberculin tested, those in the age group 15-24 showed 65 per cent positive reactions; in the 25-44 year old age group, 88 per cent had positive reactions; in the 45-64 year old group, 90 per cent had positive reactions; in those over 65, 82 per cent had positive reactions. It is to be remembered that a large proportion of these patients had been in residence in the institutions for several years.

The female inmates who were tuberculin tested did not differ significantly from the males in the incidence of positive reactions by age groups. Of the females tested in the 15-24 year old group, 68 per cent were positive; in the 25-44 year old group, 83 per cent were positive; in the 45-64 year old group, 85 per cent were

positive; and in those over 65 years of age, 79 per cent were positive.

When the X-ray findings on the group of positive reactors to the Mantoux test were considered, it was observed that the incidence of first infection (or childhood-type) tuberculosis by X-ray represented by calcified hilum glands or Ghon tubercles in this series, was 53 per cent for all ages with a slightly higher percentage in the age group 45-64 years for both males and females. That is, approximately 53 per cent of all the positive reactors showed evidence of first infection type of tuberculosis by X-ray as the only X-ray evidence characteristic of tuberculosis.

By reinfection type tuberculosis is meant definite evidence of parenchymal infiltration characteristic of either minimal, moderate or far advanced pulmonary tuberculosis. When reinfection type tuberculosis is mentioned, this refers only to X-ray evidence, as the clinical diagnosis of reinfection type tuberculosis is dependent upon other medical factors such as history, physical and laboratory findings. In the male inmates in the age group 15-24, nine per cent showed reinfection type tuberculosis by X-ray. In the age group 25-44, 11 per cent showed reinfection type tuberculosis; in the age group 45-64, 11.2 per cent; and in the age group 65 years and over, 15.2 per cent.

In the female inmates in the age group 15-24, ten per cent reinfection type of tuberculosis was found in the positive reactors. In the age group 25-44, 13.7 per cent; in the age group 45-64, 12 per cent; and in the age group 65 years of age and older, 17.5 per cent. It will be noted that the females, in the 25-44 year old group and the 65 year old and over group, had a slightly higher incidence of reinfection type tuberculosis among the positive reactors than the males, although this is of doubtful significance.

When the number of diagnoses of reinfection type tuberculosis is considered in relation to the total number Mantoux tested, instead of in relation to the number of positive reactors, it is seen that in the male inmates age group 15-24 there are 206 persons, of whom 5.8 per cent have reinfection type tuberculosis; in the age group 25-44, the incidence is 9.7 per cent in the 1,710 persons. In the age group 45-64, the incidence is 9.9 per cent in the 2,169 persons; and in the 909 persons in the age group 65 years and over, 12.5 per cent have reinfection type tuberculosis. The data for the females do not differ materially from those of the males.

Table 1 shows also the distribution of Mantoux reactions and X-ray findings of 1,566 commitments to three hospitals for the insane in Minnesota in 1936, which represents examinations on 95 per cent of all commitments. Of males in the age group 15-24 were included ten per cent of the cases, 38 per cent were in the age group 25-44, 29 per cent in the age group 45-64, 19 per cent in the age group 65 years and over, and the ages of four per cent were undetermined. The

females were distributed similarly by age-group with the exception of the 15-24 year old group which included 13 per cent of the cases instead of ten per cent as in the males. It is unusual to have such similar distributions of age groups in the males and females in an unselected group of the population whose only common bond is insanity and that, of course, not by choice. There were 60 per cent males and 40 per cent females.

In the newly-admitted male inmates Mantoux tested in the age group 15-24, 43 per cent were positive; in the age group 25-44, 66 per cent were positive; in the age group 45-64, 83 per cent were positive; and in the age group 65 years and over, 58 per cent were positive. It is to be noted that these persons were Mantoux tested upon arrival at the institutions before there was any opportunity for contamination with tubercle bacilli through institutional contact.

The newly-admitted female inmates show a similar distribution of positive reactions by age group, with the exception of the age group 45-64, in which only 72 per cent were positive, as compared with 83 per cent positive in the males of similar age. The number of inmates in these two age groups, however, were relatively small, 180 and 271 respectively.

The X-ray findings of the positive reactors in the newly-admitted patients are of interest. Of the males in the age group 15-24, first infection tuberculosis was shown in only ten per cent; in the age group 25-44, 16 per cent; in the age group 45-64, 25 per cent; and in the age group 65 years and over, only 16 per cent of first infection type tuberculosis alone by X-ray was demonstrated. Of the females in the age group 15-24, first infection type tuberculosis was seen in 23 per cent; in the age group 25-44, 19 per cent; in the age group 45-64, 29 per cent; and in the age group 65 years and over, again only 17 per cent showed first infection type tuberculosis by X-ray. In considering the number of positive reactors who showed reinfection type tuberculosis by X-ray, it is observed that in the age group 15-24, there were no reinfection type cases; in the age group 25-44, 4.2 per cent had reinfection type tuberculosis; in the age group 45-64, eight per cent; and in the age group 65 years and over, 9.4 per cent. Of the females with positive reactions to the tuberculin test, in the age group 15-24, 6.4 per cent showed evidence of reinfection type tuberculosis; in the age group 25-44, 7.6 per cent; in the age group 45-64, 6.2 per cent; and in the age group 65 years of age and over, 12.3 per cent showed evidence of reinfection type tuberculosis.

In considering the number of diagnoses of reinfection type tuberculosis in relation to the total number of persons Mantoux tested instead of the number of positive reactors in each age group, some interesting percentages were observed. Of the males in the age group 15-24, no reinfection type cases were found; in the age group 25-44, 2.8 per cent had reinfection type tuberculosis; in the age group 45-64, 6.6 per cent; and in the age group 65 years and over, only 5.5 per cent. In the females, the distribution was not unlike that of the

males with the exception of those 65 years old and over, of whom 7.2 per cent showed evidence of adult type tuberculosis.

For purposes of comparison, the males and females in the survey cases may be combined into one group because their age group distributions are similar and the Mantoux test and X-ray findings in the males and females by age groups are not significantly different, and can reasonably be grouped together. This is also true of the newly-admitted cases in regard to sex, age, tuberculin reaction, and X-ray findings.

In comparing the number of positive reactors to the tuberculin test in the age group 15-24, there were 25 per cent less positive reactions in newly-admitted cases than in the survey cases; in the age group 25-44, 22 per cent less; in the age group 45-64, only nine per cent less; and 23 per cent less in the age group 65 and over. It is not unreasonable to assume that the survey group was similarly less infected on first admission to the institutions, and that the relatively higher incidence of tuberculous infection as demonstrated by the positive tuberculin test during the survey could be attributed in part to institutional contact with infectious cases of tuberculosis.

Further evidence to strengthen this contention is shown when the number of persons with first infection type tuberculosis is examined in the two groups. In contrasting the newly-admitted cases with the survey cases, in the age group 15-24, there was 35 per cent less first infection type tuberculosis in the newly-admitted group; in the age group 25-44, 36 per cent less; in the age group 45-64, 27 per cent less; and in the age group 65 and over, 34 per cent less cases of first infection type tuberculosis.

The most noteworthy differences become apparent in the relative incidences of reinfection type of tuberculosis. Comparing the survey and the newly-admitted inmates, in the age group 15-24, there was a decrease from 6.2 to 1.1 per cent; in the age group 25-44, from 10.5 to 3.5 per cent; in the age group 45-64, from 10.1 to 5.8 per cent; and in the age group 65 years old and over, from 13.0 to 6.1 per cent. In other words, the percentage of cases of reinfection type tuberculosis found in the newly-admitted inmates was less than one-half of the percentage of cases in inmates who had been in residence in the institution. This strikingly demonstrates the need for, as well as the value of, routine examination for tuberculosis in state institutions, particularly for the insane.

In comparing the total number of survey cases with the total number of newly-admitted cases, statistical corrections must be made because of the differences in age group distributions. These corrections are obtained by arbitrarily using the population of the survey cases as a standard population and applying the percentages of positive reactors and X-ray findings in both the survey and newly-admitted cases to this population by respective age groups. The rates thus obtained are directly comparable, other things being equal.

After statistical correction of rates, the survey cases showed 85 per cent positive reactions to the tuberculin test, while the newly-admitted were only 69.0 per cent positive. First infection type tuberculosis was found in 53 per cent of the positive reactors in the survey group, while only 22 per cent had first infection type tuberculosis in the newly-admitted group. Reinfection type tuberculosis was found in 12.5 per cent of the positive reactors in the survey cases, while only 7.1 per cent was found in the newly-admitted group.

These differences are so striking that it is hardly necessary to mention that they are statistically significantly different.

In absolute numbers, it is observed that actually 67 cases of reinfection type tuberculosis were discovered by routine tuberculin testing and X-ray examination of 1,566 newly-admitted insane persons at the time of their commitment to an institution. Of these 67 cases, 45 per cent were minimal, 25 per cent moderately advanced, and 30 per cent were far advanced by X-ray. The majority were early cases and ones most likely to become arrested under careful medical supervision. Five of the cases had positive sputum and were immediately isolated. These persons came from various counties in the state and were not originally concentrated in one particular section.

A dual function is performed by identifying these persons with reinfection type tuberculosis on admission to a state institution; first, medical care becomes available—second, isolation from uninfected inmates is possible. The unfortunate inmate, who labors under the double liability of both insanity and tuberculosis, can be given adequate medical supervision and care from the start, and, if indicated, remedial treatment for whichever of his impairments is remediable. By isolation of the infectious newly-admitted cases, the second objective is gained. That is, spread of the disease among uninfected inmates in the general wards is prevented. This is a real threat when one considers the intimate contact resulting from overcrowding among 9,000 insane people, the majority of whom are incapable of carrying out the simplest principles of personal hygiene and cleanliness.

The question of follow-up of inmates with tuberculosis in the institutions, their medical care and isolation will not be discussed at this time. That is a major problem in itself. Suffice it to say that effective methods are being employed to provide isolation and segregation of tuberculous inmates as well as special facilities for hospitalization. It is planned to re-test all the inmates in residence in 1937 who were negative to the tuberculin test during the survey in 1935. This work will be finished in the summer of 1937 and should throw additional light on the effectiveness of the barriers that have been set up to stop the spread of tuberculosis in state institutions.

The logical sequence to a comprehensive tuberculosis survey of inmates of state institutions in Minnesota has been the development and execution of a system of

routine examinations for tuberculosis which already are showing measurable benefits and productive results.

This relatively inexpensive procedure is of paramount importance from a public health point of view and should result in definite economies for the state in the institutional care of its wards, in actual savings in human life, and in higher standards of public welfare.

Conclusions

(1) The distributions of positive tuberculin reactions and X-ray findings by sex and age groups have been shown in a group of inmates of institutions for the insane in Minnesota—first, in 1,566 newly-admitted persons, and second, in 8,969 persons surveyed after a considerable period of residence.

(2) The survey cases showed 85 per cent positive reactions to the tuberculin test, while the newly-admitted cases were only 69.0 per cent positive (corrected rate).

(3) First infection type tuberculosis was found in 53 per cent of the positive reactors in the survey group,

while only 22 per cent (corrected rate) had first infection tuberculosis in the newly-admitted group.

(4) Reinfection type tuberculosis was found in 12.5 per cent of the positive reactors in the survey cases, while only 7.1 per cent (corrected rates) had reinfection tuberculosis in the newly-admitted group.

(5) A striking difference is demonstrated in the relative incidence of reinfection type tuberculosis in the total number of survey cases, 10.7 per cent, when compared with the incidence in the total number of newly-admitted cases, 4.9 per cent (corrected rate)—an actual decrease of 5.8 per cent, and a relative decrease of 54 per cent.

(6) As a result of routine Mantoux tests and X-ray examination of newly-admitted inmates, two objectives in the control of tuberculosis in state institutions have been gained, the early recognition of tuberculosis in newly-admitted inmates and the early isolation of infectious cases, which results in the prevention of the spread of the disease to uninfected individuals.

The Present Status of B. C. G. Vaccination*

W. P. Larson, M.D.**

Minneapolis, Minn.

DURING the past 15 years, voluminous literature has accumulated on the subject of immunity in tuberculosis resulting from vaccination with B.C.G. The work of Calmette is too well known to necessitate an extended discussion of B.C.G. vaccination. In the interests of context, it may be pointed out that Calmette and Guérin cultivated a bovine strain of the tubercle bacillus on glycerine-bile potato for a period of about 13 years, during which time the organism lost its pathogenicity. After determining the organism was no longer pathogenic, Calmette tested its immunizing properties by injecting the living culture into beeves. He found that the animals developed no tuberculous lesions as a result of the injections and, furthermore, he observed that these cattle would now withstand an intravenous injection of virulent bovine organisms without developing lesions. Calmette believed, therefore, that the bacillus of Calmette and Guérin (B.C.G.) might be used as an immunizing agent not only for cattle, but for man as well.

The foundation for this work was laid a number of years previously by Behring, who injected a virulent human strain of the tubercle bacillus into young beeves. He found that the human strain of the bacillus failed to produce progressive tuberculosis when inoculated intravenously into cattle. Only mild retrogressive lesions were observed which tended to calcify. Behring found

further that animals which had been injected intravenously with a living human strain would resist infection by a virulent bovine strain when the latter was given after the animals became tuberculin positive. Unfortunately, when the animals which had been inoculated with the human strain came to lactation, living tubercle bacilli of the human type could be demonstrated in the milk. This naturally militated against the practical application of this procedure. Behring then attempted to effect the same result by using an avian strain, since the latter is not pathogenic for man. The avian strain, however, failed to confer an immunity in cattle.

The fact that the human strain appeared in the milk of the animals that came to lactation shows that the organism is somewhat pathogenic for cattle, since they would not have been able to pass the mammary gland without first having produced a lesion. It is improbable that a non-pathogenic organism can establish itself for more than a brief period in the animal body.

During the past 40 years many investigators have shown that experimental laboratory animals may be protected for short periods by vaccination with killed cultures. Animals thus protected usually outlive control animals by a few weeks; in some cases, by several months. Complete protection, however, has seldom, if ever, been achieved.

During the years 1927 and 1928, the writer, in conjunction with Evans, conducted an experiment for the Illinois Department of Agriculture at Springfield on

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**Professor and Head, Department of Bacteriology, University of Minnesota.

the possibility of protecting cattle against tuberculosis, using the method recommended by Calmette. A strain of B.C.G. was kindly supplied us by Dr. Calmette, and a group of 40 animals vaccinated according to Calmette's specifications. The animals selected for the experiment varied in age from a few months to about three years. They were all obtained from tuberculin-free areas and given the tuberculin test before being sent to the experimental farm. The animals were each given 100 mg of B.C.G. subcutaneously. A short time after the tuberculin test became positive, there was introduced into the herd a group of reactors known to be "spreaders." At the same time, a group of 20 tuberculin-negative cattle were introduced as controls. The experiment now embraced some 60 head of cattle which were maintained in a 20 acre enclosure. During the entire course of the experiment, the herd was fed on dry feed and had access to a common water trough. Approximately 18 months after the introduction of the infected cattle, the entire group was autopsied. Every animal in the experiment was found to be infected with tuberculosis. The lesions in the vaccinated group were as extensive as in the control group. This experiment may be open to the criticism that the animals were too heavily exposed. We attempted to duplicate conditions on the average midwest farm as far as possible, in order to determine the value of the B.C.G. vaccination under natural farm conditions. The conclusions of our experiment were naturally that B.C.G. vaccination was of no value in protecting against bovine tuberculosis under natural conditions of exposure.

Rankin, who also conducted vaccination experiments on cattle, reports somewhat more favorable results than our own. In a group of animals vaccinated with B.C.G. and later injected intravenously with 5 mg of a virulent bovine strain, he found that only 20 per cent of the vaccinated animals showed macroscopic lesions, whereas 95 per cent of the non-vaccinated developed such lesions. On the other hand, 80 per cent of the vaccinated animals did show microscopic lesions. Rankin's work, therefore, seems to indicate that there is very little protection afforded by B.C.G. vaccination when the animals were later tested by intravenous inoculation of the virulent organism, although the lesions produced were somewhat less extensive than in the controls.

In another series of experiments, Rankin exposed the vaccinated animals to natural infection following B.C.G. vaccination. In this group, 92 per cent of the non-vaccinated animals developed tuberculosis, while only 34 per cent of the vaccinated developed tuberculosis. The time of exposure is obviously an important factor in experiments such as these. Rankin exposed his animals for a period of time varying from four to eleven months. A further six months' exposure would, no doubt, have given a much higher percentage of tuberculosis among the vaccinated animals. As the disease spreads, exposure becomes heavier and more continuous until finally all the animals become infected, as was the case in our experiment. The time exposure element undoubt-

edly explains the difference in results between Rankin's experiments and our own.

Watson likewise reports unsatisfactory results in his efforts to establish a protective immunity in cattle.

In view of the uniformly negative results obtained on cattle vaccinated with B.C.G., there is little reason to expect marked success in vaccinating humans by this method.

The fact seems to be well established that immunity to tuberculosis exists only so long as living tubercle bacilli remain in the body. Gay suggests the term "non-sterilization immunity" for this type of resistance. Soon after the bacilli disappear from the body, or the lesions heal, the immunity, which at best is of low order, is lost.

Confident of the innocuity of B.C.G., which is now universally accepted, Calmette proceeded to vaccinate children on a large scale. He recommended peroral vaccination, which was administered to the infant during the first ten days of life before it had had an opportunity to become exposed to virulent organisms. It was soon found, however, that only about six per cent of the children so vaccinated became tuberculin-positive, and the method was, therefore, abandoned in favor of the subcutaneous or the intracutaneous methods of administration. Most children became tuberculin-positive following the vaccination by the parenteral route; the individuals thus vaccinated remain tuberculin-positive from two to six years. This probably represents the maximum period of immunity which would result following vaccination. Calmette recommends that children be revaccinated at the ages of three, seven and fifteen years respectively. These recommendations evidently are not based on experience, as there are no results upon which such conclusions could be based, and hence they should be regarded merely as suggestions. In spite of the fact that approximately one and a half million children have been vaccinated during the past 15 years either by the peroral or parenteral routes, conclusive evidence that vaccination possesses merit is still lacking.

There are numerous reports in literature, in addition to those of Calmette, in which the authors conclude that B.C.G. vaccination has been of definite value in protecting against tuberculosis. With the exception of the reports of Heimbeck and Wallgreen, the evidence submitted in support of such conclusions fails to carry conviction.

Calmette reports a lower non-tuberculous death rate among the vaccinated than in the general population. He states that the non-tuberculous mortality rate among the vaccinated has been found to be as low as 50 per cent of that of the general population. Lampadarios and Stravropoulos, who vaccinated approximately 7,000 children, found that the non-tuberculous mortality among the vaccinated was 2.8 per cent, while among the non-vaccinated it was 21.7 per cent. Such a lowering of the non-tuberculous mortality rate among the vaccinated is difficult to comprehend. There remains a suspicion that the vaccinated and control groups were

not comparable in all respects. On the other hand, Park observed a higher non-tuberculous mortality rate among the vaccinated than in the general population.

The work of Heimbeck represents one of the best controlled studies which has been reported. Heimbeck's material comprised 1,434 probationary nurses. Forty-six and a half per cent of these nurses entered the hospital with a positive tuberculin test, while 53.5 per cent were negative. None of the nurses who were tuberculin-positive at the time they entered their hospital training died of tuberculosis during the training period, while there was a mortality of 3.5 per cent of the tuberculin-negative nurses. Of the group which remained negative after B.C.G. vaccination, 1.8 per cent died, while the mortality rate among those who became positive as a result of vaccination was only 0.37 per cent. The work of Heimbeck, therefore, seems to indicate the tuberculin-positive nurse is more resistant to tuberculosis than is her tuberculin-negative comrade.

Wallgreen, of Goteborg, Sweden, vaccinated 355 children by the intracutaneous route. None of these children was exposed to tuberculosis until after they had become definitely tuberculin-positive. The organization of the municipal dispensary at Goteborg gives Wallgreen access to all cases of tuberculosis in the city. Of 230 vaccinated children who had become allergic as a result of B.C.G. vaccination, and later exposed to tuberculosis in the home, only two have died, neither of whom showed signs of tuberculosis at autopsy. Wallgreen's results, like those of Heimbeck, would seem to indicate that there is some temporary value from vaccination. If these results could be shown to be due solely to the vaccination, its value could not be questioned. However, in a group such as this, which is controlled by a well organized dispensary, the educational side of prophylaxis has no doubt not been neglected.

It is a well established immunologic principle that little can be expected in the way of prophylactic vaccination against those infections which do not terminate in an immunity. In other words, one may expect a

result from vaccination in those infections which are followed by immunity. Thus, one would expect to be able to protect against typhoid fever, since this disease is one of a number which leaves a life-long immunity following convalescence. Indeed, vaccination is partially successful against typhoid fever, but the immunity obtained following vaccination is not comparable to the immunity which results from the infection. The immunity following typhoid vaccination is probably not of more than two or three years' duration. Tuberculosis, on the other hand, does not confer a high degree of immunity. It is a common observation in the autopsy room to see active tuberculosis in a case where healed lesions exist; and it is not uncommon to see active and spreading lesions exist where others are healing.

It is evident, therefore, that active tuberculosis lends only a temporary and probably very low grade immunity. In view of the fact that immunization of experimental animals has been most disappointing, there is no reason to expect that the results in humans should be more favorable. The effects of sanitation and education may readily be credited to the effect of vaccination, an effect which is unobtainable in experimental animals. In view of the fact that a million and a half children in various parts of the world have already been vaccinated against tuberculosis with B.C.G., we would do well to await the outcome of this work before proceeding too hurriedly with a general vaccination program. The only place in which vaccination could possibly be justified in the light of our present knowledge would be under conditions such as those of Heimbeck, where it is desired to protect a group for a limited period of time. Under the most favorable conditions, there is little reason to expect that the protection, if any, is of more than a few months' duration.

Successful vaccination against tuberculosis involves the paradox of using a virulent organism—in order that it may establish and maintain itself in the host—and yet one that will not produce infection. Such a strain has, as yet, not appeared upon the horizon.

Some Thoughts on Tuberculosis of Fascia and Muscle*

Charles K. Petter, M. D.**

Oak Terrace, Minnesota

A PATIENT with multiple tuberculosis lesions of fascial compartments and of the skin, who came under my observation about a year ago and whose case is reported herewith, led to a review of the literature and a rather critical analysis of reports of fascial and muscular tuberculosis. This report consists of a case summary and an attempt to evaluate the various

descriptions of tuberculosis of fascia and muscle which were collected in connection with this case study.

The patient was a white male, age 27, admitted to Glen Lake Sanatorium, July 10, 1934, with far-advanced pulmonary tuberculosis. Sputum was positive and daily temperature varied between 98.2 and 99.8° (F). There was no evidence of extra pulmonary tuberculosis on physical examination.

About August 15th, he began to complain of pain in the region of the right elbow, which was not severe

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**Glen Lake Sanatorium, Oak Terrace, Minnesota, and Department of Surgery, University of Minnesota, Minneapolis, Minnesota.

and occurred only upon resuming motion after a period of rest. During the next four weeks an area of swelling appeared proximal and medial to elbow, which was somewhat fluctuant, not hot or tender, and showing no skin change.

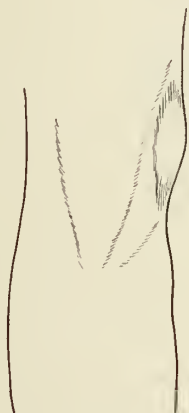


FIGURE 1

Swelling which appeared proximal to right elbow; operative findings shown in Figure 7.

During September, several skin lesions appeared on the fingers and toes, which were diagnosed as tuberculosis of the skin. In November, aching over extensor surface of forearm occurred and an elliptical swelling 6x4 cm. appeared. The skin was not changed, nor attached to the mass and not reddened, but was locally warm.



FIGURE 2

Fascial lesion on right forearm (see also Figure 5).

In the latter part of December, pain on dorsi flexion of the right ankle developed, followed by limitation of motion and later by a constant pain "back of the ankle" accompanied by a bulging mass anterior to the tendo-achilles, posterior to the lateral malleolus. This swelling was tender and warm but the overlying skin



FIGURE 3

Swelling anterior to tendo Achilles due to mass of tuberculous granulation tissue in fascial compartment.

was not grossly abnormal. In February, 1935, a small swelling appeared just below and anterior to each malleolus, on the right foot. These were tender, boggy, and warm, but not reddened or attached to the skin (Figure 4).



FIGURE 4

Right foot, showing fascial lesions below malleoli.

During this period the patient had had no appreciable change in his general body temperature, nor in his general regime, which consisted of bed rest, carbon arc irradiation and local heat (infra-red and hot baths) to the affected parts, including the skin lesions.

Treatment: On January 15, 1935, the lesion on right forearm was incised, and a large mass of peculiar gelatinous-appearing granulation tissue was found in the

intermuscular septum between the extensor carpi radialis and the brachio-radialis muscles (Figure 5). This was re-

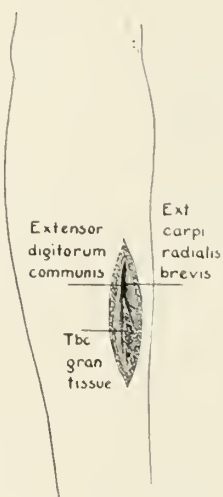


FIGURE 5

Operative findings in lesion of right forearm.

moved and the wound closed, later breaking down.

The lesion anterior to the tendo-achilles was similarly exposed on January 28, and a large mass of the same gelatinous appearing granulation tissue with some watery exudate removed from the fascial compartment anterior to the tendon. This was thoroughly cleaned-

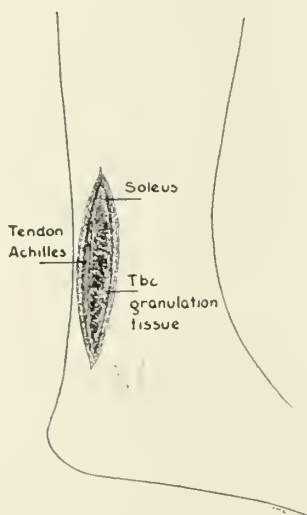


FIGURE 6

Findings at operation, right foot (see Figure 3).

and sutured after swabbing with iodine.

A mass of the same type of granulation tissue was removed from the intermuscular space between the medial head of the triceps brachii and the extensor carpi radialis longus on February 5th. Because of the tunneling

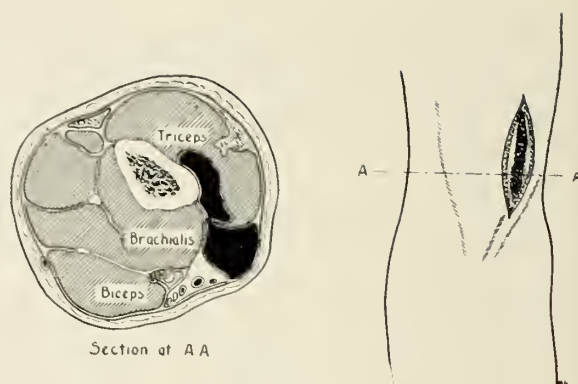


FIGURE 7

Operative findings in lesion shown in Figure 1. A cross section of arm shows extent to which the disease process extended under triceps.

necessary to remove all of the granulation tissue, this wound was left open, but healed well after a few weeks.

On March 11th, the lesion below the lateral malleolus was incised and curetted. The medial lesion was not incised until some time later.

In July of 1935, the wound on right forearm which had closed and reopened several times after the original evacuation was reopened and a pocket of granulation tissue found in the proximal extremity of the wound, probably overlooked at the first procedure. This was removed, and the wound sutured, healing in a relatively short time.

Post-operatively, these lesions were all treated by intense heat therapy in the form of infra-red irradiation and hot baths, and the skin as well as the facial lesions are now healed.

Because of the frequent co-existence of tuberculosis in the kidney with similar lesions in the organs of locomotion, a guinea pig was inoculated with six specimens of urine from this man. No tuberculosis developed in this guinea pig.

Tissue removed from the facial lesions showed tubercle formation on section and some of the granulation tissue injected into a guinea pig produced tuberculosis in the pig. The skin biopsies showed tubercle formation on section.

Discussion: Tuberculosis of the fascia is generally described as an extension of the disease from a bone, joint or infected lymph gland, and cases of this type constitute most of those reported prior to 1916. The case just described is one of so-called "Primary" or hematogenous infection and a review of the literature reveals but few such cases reported. Blackburn¹ has reported one such case and describes the pathology as, "... bacilli pass through the blood stream and find lodgement in fascia. In this form the connective tissue is usually transferred into a mass of granulation tissue ...".

Tuberculous involvement of fascia by direct extension is a very different problem from the primary lesion. The latter is relatively benign, and yields readily to surgical treatment. This, however, must consist of complete evacuation of the diseased areas, and not partial aspiration followed by injection of iodoform into the lesion, as has been the practice in the past.

In considering the relatively few reports of tuberculous fastitis and the correspondingly greater amount of literature on tuberculosis of the muscle, one is impressed by the fact that many so-called cases of muscle tuberculosis are after all fascial tuberculosis. Skeletal muscle fibers are surrounded by fine connective tissue, the muscle bundles by a heavier sheath, and the separate muscles by fascial sheaths of very dense white fibrous tissue. In these connective tissue spaces run the blood vessels,² and here also occur the tuberculous processes which may extend to invade other spaces and ultimately destroy the muscle fibers by toxin and interruption of blood supply.

It is with hesitation I suggest that muscular tuberculosis and fascial tuberculosis are two terms applied to the same process. Yet, since connective tissue septa of varying degrees of fineness constitute a part of every muscle, and since the blood vessels in the muscle occur in these connective tissue spaces, and since the tuberculous granulation tissue forms in these same spaces it seems that tuberculosis of fascia covers the whole field. Mitchell³ in 1908 stated "the origin and extension is in connective tissue; therefore, there is no true tuberculosis of muscle" and Plantard⁴ states "tubercle has never been described in the muscle fiber." When the so-called fascial lesion extends, the center of the granulating mass may become necrotic and the periphery sclerotic forming an abscess. As the nutrition of the muscle is interfered with, a resulting cirrhosis or atrophy will occur. These changes make up the three "types" of muscular tuberculosis described in the German and French literature, namely (1) nodular (tuberculous granulation tissue), (2) abscess and, (3) cirrhotic type. Rather than distinct types, these are probably manifestations of different stages of the same process.

Many of the reported cases of fascial tuberculosis from 1899 to 1905 contain reference to "cysts under Pouparts" filled with pus, from which fascial nodules and abscesses arose. The descriptions are as a rule not good, and leave one wondering if the cysts referred to are not psoas abscesses pointing below Pouparts. We have seen two cases of this type with invasion of the fascial planes to the mid-thigh. References to the "cys-

tic" type of fascial lesions may be found in the older text books on surgery, such as in Senn's *Principles of Surgery*, 1890, and in a few German articles of the same decade.

Muscle tuberculosis was first described in 1886 by Habermaas and Muller, each reporting a case. Since that time there have been 55 additional cases reported in the German, French and Italian literature, with five by American authors.

A review of the orthopedic cases treated at Glen Lake Sanatorium reveals only this one case of tuberculosis of the fascia, and no proven case of so-called tuberculosis of muscle. The incidence then would be 0.015% of all our tuberculous patients, or 0.3% of the orthopedic series, including lesions of bones and joints, tendon sheaths and bursae.

Summary:

1. A case of "Primary" multiple tuberculous lesions of fascia is reported, in which healing took place following surgical evacuation.
2. The lesions developed simultaneously with a "crop" of skin lesions, as the result of a hematogenous dissemination.
3. At the time of this report, the patient has shown no evidence of other extra-pulmonary tuberculosis, and is just beginning to clear his pulmonary lesion (after 18 months).
4. So-called tuberculosis of muscle is truly a tuberculosis of the fascial sheaths or septa of the muscle, since tubercle formation in muscle fiber has never been observed.
5. "Primary" tuberculosis of the fascia occurred once in 309 cases of orthopedic tuberculosis (0.3%), and 6180 cases of all types of tuberculosis (0.015%).

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Newer Concepts in the Epidemiology of Tuberculosis

Hilbert Mark, M. D.*

St. Paul, Minn.

WITHIN the past decade, the therapy of pulmonary tuberculosis has made rapid strides, but only because of the improved and finer methods of diagnosis of the disease at its inception. With this ability for diagnosing early tuberculosis has come an enlightenment in the concept of this disease in its entirety. Pulmonary tuberculosis has been divided into two main groups: primary complex, or what is generally known as childhood type of tuberculosis; and reinfection, or adult type. The primary complex is that body reaction which takes place when tubercle bacilli invade a host for the first time with the formation of one or more tubercles. The cells of the host are then altered so that future invasion of the bacilli may produce a more ulcerative type of disease, the production of which will depend upon the balance of resistance of the host against mass infection. The border between primary and reinfection disease is very narrow, so that at times it is difficult to know where one leaves off and the other begins. In primary groups, the mortality rate is exceedingly low and thereby influences the prognosis and therapy.

A large percentage of this group will heal with little or no X-ray clinical evidence. Sometimes, on subsequent examination, Ghon tubercle, calcified glands, or fibroid areas may be found roentgenologically. The remainder, at sometime or other during the life of the host, will show reinfection either from an exogenous or an endogenous source.

The disease resulting from the tubercle bacillus invasion in a previously-infected individual, or from the breakdown of a primary complex (freeing of tubercle bacilli causing an extension from an inner source) is called reinfection tuberculosis. The development of reinfection is, as a general rule, insidious, so that there is an average period of two and one-half years between the onset of the parenchymal lesion and the first symptom. Because of this silent development of the disease, 90% of all patients entering Minnesota sanatoria today have moderately to far-advanced disease.

No longer can primary disease be treated as a benign infection with no consequential or subsequent seriousness; no longer can this stage of tuberculosis be passed up with a sigh of relief, but it should be placed in its proper category and continuous subsequent attention given to it. Only then can this phase of tuberculous pathology be regarded without serious intent.

Of special seriousness is the prognosis of the individual—especially under the age of three and past puberty—who has recently become infected and continues to remain in an intimate circle of infection. The addition of the exogenous infectious agents continuously intro-

duced on top of a recent pathologically active primary complex will increase the mass infection as compared to the resistance of the particular host. This type of danger is seen occasionally in the child from three years to puberty who reveals evidence of reinfection tuberculosis. It is also shown in nurses having a negative Mantoux reaction on entrance to hospital training and breaking down within a relatively short length of time with disseminating type of tuberculosis.

From the foregoing statements, four main points can be accepted as our guide for adequate epidemiology to control future tuberculous infection and reinfection:

1. Tuberculosis is a contagious disease, especially infectious in intimate circles, such as family groups, office groups, school rooms, and the like.

2. Reinfection occurs only in a previously-infected individual either from an exogenous or endogenous source.

3. Reinfection type of tuberculosis is an insidious disease, and there may be a period of years between the period of reinfection and the period of disease. The primary complex may become latent and even fairly well walled-off, yet in this area, there may be and usually are, living tubercle bacilli.

4. There is an average period of two and one-half years from the first parenchymal lesion of reinfection tuberculosis to the first symptom. As a consequence, the patient at the time he sees his physician, has developed a disease which is usually far advanced and one of serious intent. The main objectives in the proper prevention of tuberculous infection would be:

- a. Break contact; that is, isolate the open infectious cases so that other members of the intimate circle are spared the necessity of further exposure.

- b. Tuberculin tests of intimate contacts. The method generally used is the Mantoux test or intradermal method, whereby 1/10 of cc. of 1-1000 diluted O. T. is used. There are also other products on the market which are quite satisfactory which may be used to advantage in a physicians office when only a few tests are given at a time. Through this method, the extent of the spread is known.

- c. X-ray of positive reactors, excepting those falling into the age group of from three to puberty. The omission of this age group is purely one of economy based on statistics derived from a ten-year study of the Lymanhurst Clinic by Myers and Stewart. Only a few reinfections were found. It is felt that children in this group handle infection and disease remarkably well. However, should there be any clinical evidence or continued massive infection, then these children likewise should also be X-rayed. Children under three reacting to the test should be re-checked by X-ray every 3-6

*Tuberculosis Epidemiologist, Minnesota State Sanatorium, Ah-gwah-ching, Minnesota.

months until their third year. Children and adults of fourteen or over should be X-rayed at least yearly until they reached the age of 35-40 years, at which time the X-ray check-up may be spread over longer periods depending upon the general condition of the individual and previous X-ray findings.

Early tuberculosis should be treated promptly according to the latest methods. Advanced disease requires special attention and methods. In this way, it can be said that cases of tuberculosis resulting from intimate exposure, which take place in the greatest number of cases, would be diagnosed at their inception. As a result of this early diagnosis, the disease is found before the lesions have ulcerated and, therefore, before it develops into infectious type of tuberculosis. The subsequent results, naturally, will be far more successful than treating far advanced or complicated disease, both as far as the patient himself and his family are concerned. With these points, it is the thought and principle of the Minnesota State Sanatorium that the family physician and the sanatorium itself should work hand in hand in the development of a program that will control the disease. The State Sanatorium likewise believes in a system of decentralized care of the tuberculous so conducted that the sanatorium becomes a hospital for the care of the following:

1. Positive sputum cases until such cases cease to be infectious.
2. Incurable cases which because of the character of the individual may in time become of serious intent, not only to the individual but also to his family and to his community wherein he resides.

3. Cases of complicated tuberculosis needing special treatment beyond the individual's economic reach.

The local physician would then be responsible for:

1. Non-infectious types of pulmonary tuberculosis such as primary complex, pleurisies, early non-ulcerative cases, and the like.
2. Observation cases.
3. Post-sanatorium cases, such as those needing continued pneumothorax refills, continued rest care, and continued observation.

Local hospitals can be utilized for those patients who are non-infectious and who are needing only a relatively short period of hospitalization. From an economic point of view, certainly, it will be better to follow along these lines, since the cost of maintenance at a sanatorium is much greater over a long period of time than the cost of maintenance and care at home. From the patient's point of view, this plan will be to his liking. It will either replace or reduce the length of his stay at the sanatorium, and reduce or nullify his menace to the family. Under such a plan, the sanatorium field physician, now doing mostly epidemiological work, will then become a traveling consultant and liaison officer between the sanatorium group and the family physicians handling the so-called out patient department of the sanatorium.

The success of such a program will depend upon the interest taken by the family physician in the original case finding, testing, and the subsequent follow-up of the intimate contacts, and the care of the tuberculous cases discharged from the sanatorium.

The Problem of Developing A Student Health Service*

Florence Brown Sherbon, A. M., M. D.**

Lawrence, Kan.

In *The Philosophy of Health*. The philosophy of the moment seems to be *the philosophy of the whole*. It seems to me important that we should fit all thinking into the picture of an integrated universe—an organic cosmic *whole*. Science tells us that apparently this whole consists of units of force, perhaps positive and negative electricity (whatever that may be), arranged in minute atomic patterns. Atoms, in turn, relate themselves with each other in obedience to occult compulsions to form a super-pattern, apparently implicit in infinity and eternity, and revealing itself through time and space in the bewildering phenomena of life, of worlds, of suns and of galaxies, which now appear within the mere scrap of the infinite cosmos of which our senses make us increasingly aware.

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**Students' Health Service, University of Kansas.

The philosophy of wholeness—of the integration, if not the identity, of the hereditary pattern with environment (meaning by environment the sum-total of experience and relationship with the external world), in a word, the philosophy of relativity—is leavening and unifying every aspect of human thinking and behavior.

To my mind, then, the basic "problem" involved in developing a student health service is that of initial perspective—*seeing health as a quality of the whole*. Thus only can every effort be made to contribute to the symmetrical and optimal growth and development of body, mind and personality. The characteristic which distinguishes the organism—any organism let us say the student in whom we are interested—is the wholeness of response of every part of him to every experience. Public school educators are seeing this, more or less generally, and primary education is refreshingly becoming

a matter of directed living, rather than formalized instruction.

Too generally, however, higher education is still formalized and departmentalized. Scholastic subjects are still so pigeonholed and so divorced from the personal life of the student, it is probably not very far from the truth to say that the average college instructor still sees students as so many containers full or empty of mathematics, chemistry, or Latin nouns. Indeed, the instructor is commonly employed on a basis of his specific ability to fill the mental void alike of all with mathematical facts, chemical facts—and Latin nouns. With such specialized and circumscribed contact the instructor has little opportunity to see the student as a total personality. Few faculty advisors, even, are equipped by training or intuition to see the close relationship between academic work and fatigue, economic security, emotional strain, and nutrition.

One of the first persons to see the individual as a whole was the social case worker. Consciously or unconsciously, every successful social worker is a Gestalt psychologist. The case work method is modifying the technic of every effort for human betterment. The physician in his office, the personnel director in industry, the directors of progressive education schools—all keep more or less complete case records of their clienteles. The nursery school, which is perhaps the most nearly perfect example of correct educational method which we have, keeps very detailed and continuous record of every aspect of the child, his experience, and his environmental surroundings.

The public school is adopting, one by one, the items of the conventional case record, and adds to its staff school nurses, school physicians, dental hygienists, physical education directors, recreation directors, and visiting teachers. Very commonly, however, there is little machinery for routine integration of all these potential data into a unified picture of each child's personality. It is the problem child only which rates such attention *after* he has become a problem.

What is true of the public school is true to even greater extent of colleges and universities. A few highly-privileged schools are giving their students enriched living in *lieu* of lock-step learning. All institutions of higher learning are becoming humanized and are offering students many helps formerly unknown. Orientation week, physical examinations, mental tests, social deans, faculty advisors, official dormitories, student health services—all operate in the direction of unification of the life of the student. Probably most educators are in sympathy with the principle of individualizing education. To an even greater degree than in the common school, however, the parts of the student coming to the attention of the indicated agencies are assembled and integrated as a total personality picture only when and after he has become a definite problem.

II. *Need for Unification.* Our primary interest, as a group, should be to determine where a student health service fits organically into a modern scheme of educa-

tion through directed living. In order to be concrete, let us review the experience of the average student as he comes to the average campus and see what the situation suggests.

First the student brings with him certain academic credentials certifying to the status of his capacity for receiving into certain compartments of his mind additional standardized information on mathematics, chemistry, and Latin nouns: *this and nothing more!* Under present conditions, standardization is probably necessary and provides large economies of time and money, although it frequently operates against the individual. Certain institutions such as Antioch College, Reed College, Bennington College, and a few others, require certificates of physical fitness and extensive personality data for admission, and in such schools unified case records are kept. In most schools, however, the student appears with the required transcript in his hand, pays his fee, and the college proceeds after its own fashion to make his acquaintance. His high school transcript is filed in the college office. If the college provides a medical examination, record of the same is filed in the office of the examining physician who indicates that certain students are to be excused from physical education for medical reasons. The physical education department takes measurements and posture rating of the student and files these away to serve somewhat in determining his activity program. The results of the mental tests are apt to find their way to the files of the department of psychology. I speak feelingly of this because I know from experience how time-consuming and difficult it is to assemble a case record of any given student, even a problem student, under such a system.

As far as my information goes, there are few schools in which all this information is assembled routinely and made serviceable to every student and used as a basis for guidance except in cases of outstanding deviations such as compel specific attention. The average student more or less muddles through, succeeding—and he usually does succeed to some degree, but with tremendous waste—because of his own initiative and ability to integrate and organize rather than because of any specific all-round guidance from the school.

III. *The Rôle of the Student Health Service in Unification of Education.* Now what does this have to do with the student health service? Simply this: of all the campus agencies dealing with the life of the student, the health service logically has the most intimate contacts with his personal life and has the most to contribute to the integration of the curriculum with health and personality. To be sure, copies of the many and various findings of the health service should go straight to the administrative office which is the ultimate unifying agency, but let us see what the health service can do to further this end.

To go back to our freshman with his transcript in his hand, we would like to see a copy of his *medical examination* clipped to it, and both records should go to the department of *physical education* (which should be part of the health service and has no excuse for being out-

side of a broadly conceived health service) as a guide in formulating his activity program. His *structural findings and activity program* should also be added to the cumulative record, which may now go to a member of the health service whom we shall designate as the *mental hygienist, personal counselor*, or some other relevant title. While this official should have psychiatric training because of the definite number of psycho-pathologies found in any sample of population—such implications should be kept entirely in the background, and the person should function chiefly as an understanding confidant who serves principally as a clearing-house of the emotions, the repository of worries, uncertainties, doubts, hopes and ambitions. On this first occasion we should like to see him obtain a record of vocational leanings and aptitudes; of financial and social status. To this intimate personal history may be added any tests of personality traits, tastes, culture and intelligence suggested by his judgment. He will consult the medical and physical findings, and in the end add to the growing record such summary and evaluation as will serve further to interpret the student to all those-and-sundry who are supposed to serve his welfare.

Having run the gamut of evaluation, the student may finally approach his *academic advisor*, who is now, with these data before him, and not until now, in a position intelligently to assist the student to plan his scholastic work. We hope that the *social deans* also will scrutinize each case record and assist each student personally, according to his need, to find a congenial social group and assist him to plan for balanced cultural and recreational life. The personal counselor certainly should co-operate in this, particularly in immediately identifying those students lacking in social aptitudes and needing specific social guidance.

IV. *The Rôle of the Student Health Service in the Continued Direction of Living.* The student having established personal working relationship with the health service the next immediate duty of the service is that of *supervision of conditions* under which the student lives. The institution should feel obligated to the parents and to the student to provide living conditions of a salutary character. This means inspection of rooming houses, official, organized and private, as to sanitation, heat, light and ventilation. Having made up a list of *approved rooms*, the health service should next concern itself with *food*. No other one thing is so vital to the young adult as is his nutrition. All eating places, official or private, catering to students, should be inspected and rated as to sanitation, health of the food handlers, quality and balance of food, and an official list of *approved tables* should be prepared.

The foregoing procedures take care, fairly well, of the personal situation of the student. The institution now has a further obligation to provide a *class-room setting* which shall not injure his health. We will probably agree that most schools might advantageously be supervised by the trained personnel of the health service as to the heating, ventilation and lighting of class-rooms,

laboratories and libraries; also as to toilet facilities, rest rooms, water, cleanliness, and comfortable seating.

All this settling and adjustment takes time. At last, however, we will assume that our student is occupying a good room, eating at a good table, carrying a reasonable and individualized schedule of exercise and work, and is sitting in airy, clean class-rooms. Does the health service have anything further to do? Verily, a-plenty! the medical staff now settles down to *follow up the deviates*, to examine and dispose of its screenings. In any unit of several hundred to several thousand students there will be found those suffering from infected sinuses, tonsils and appendices; from hyper-and hypo-thyroidism and other glandular derangements; allergies; constipation; menstrual disorders; there will be tuberculin positives to be X-rayed and followed up; there will be damaged hearts; there will be underweight and obesity; there will be defects of vision and hearing; there will be defects of locomotion; teeth will need attention; there will be immunizations to give. The full duty of the medical service will not be discharged until *every remediable defect has been removed*.

In addition to this, the maintenance of *dispensary service* for the care of injuries and minor ailments consumes a prodigious amount of time, but it is one of the most important functions of the health service both as a preventive measure, and as providing opportunity for individual health instruction.

The provision of *up-to-date hospital care and medical and surgical care* for sick students is expensive but, in many local situations, an indispensable item of the health care of the student. In epidemics it is a life-saving matter. The organization and maintenance of hospital care is difficult, complex, and the variety of difficulties and scope of difficulties differ in each situation.

Nor are we through listing the duties of the health service. The most far-reaching and constructive of its manifold duties is that of *health education*. The student comes in more or less competent physically and more or less intelligent about his body. We may examine him, direct him, protect him as long as he is under our particular care. If we do not, at the same time, communicate to him an *enthusiasm for health* and craving for enlightenment, we have only made of him an automaton. We have only partly done our job. How to arouse this enthusiasm and impart this enlightenment is a perpetual challenge to any health service. Up-to-date, vitalized, factual instruction must be supplemented by continuous personal conference and by the stimulation of personal interest and personal responsibility for his own welfare on the part of every student.

Nor is this all! Having come thus far—the sorting of the findings will draw the service, willy-nilly, into *problems of social life*. The venereal diseases are appropriately termed “social disease” and they are found on every campus. There is the problem of sexual promiscuity with its inevitable trail of accidental pregnancies and social disaster. There is the no-man’s land of the sex life of the unmarried young adult which might appropriately be taken over by the health service for study

and some measure of guidance. Sex is essentially and basically a matter of physiology and psychology—a problem in psycho-biology—and only secondarily a matter of manners and morals. The student comes to college at the height of the mating urge. Why in Heaven's name should this not be frankly-recognized? Why should not the college help to orient him in this intrusive and important aspect of life, and extend to him understanding and such guidance as we know how to give? Granting this should be done, is there on any campus a more logical agency for the purpose than the health service? The sex life of the student, no matter how disciplined he may be (and how few are disciplined in personal control of any sort!), ramifies through and permeates his emotional, mental, and physical existence; nothing is of so much importance to his future happiness as that he shall find balance, poise, and inspiration. The general ignoring of this fact is one of the greatest deficiencies of our whole educational system.

The personal counselor will find himself drawn into many other sorts of social situations in this analysis of emotional difficulties—he will find himself co-operating earnestly with many campus agencies in the effort to provide normal social and recreational life.

It would seem that at last we have the "whole" student before us, and that the health service must have discharged every possible duty toward him. The trouble is that by this time many questions have opened up for which there is only a partial answer or no answer. So, in addition to the comprehensive program here outlined, we will have to impose upon the health service the perpetual obligation to *investigate, experiment, and report*.

It is interesting to look through the *Proceedings* of the American Student Health Association and see the nice balance which has obtained from the beginning in the presentation of authoritative papers upon medical subjects: symposiums on administration and integration of college health work and especially, with increasing frequency, reports of investigation and research in the many unsolved subjects of interest.

V. *The Practical Aspects of the Development of a Health Service*. Having the possible scope of a student health service freshly in mind, it is discouraging to realize that the ideal, completely unified service probably does not yet exist, although it would seem to be closely approximated in the endowed progressive education colleges and in the Universities of Michigan and Leland Stanford, the Teachers' Colleges of Towson, Maryland; Ellenberg, Washington; and doubtless in many other universities and colleges of whose complete programs the writer is in ignorance.

The first practical problem is *how to make a start*. One gathers from reading *The Proceedings* that actually any interested individual may make a start. One can build the outlines of a complete service about the needs of any student. Take the instance which I happen to have observed, of an obese girl discovered in a nutrition class—solving her situation involved a medical examination and diagnosis with glandular and dietetic

treatment; structural examination with supervised exercise; a conference with a mental hygienist over the matter of an inferiority complex; with the social dean over recreation; and a consultation with her academic advisor over capitalizing really outstanding mental ability, and, last but not least, a conference with the clothing instructor over the matter of becoming dress. The end result is a splendid woman now occupying a position upon the faculty of her alma mater. In this particular instance the integrated service was not to be had except piecemeal—the integrated result was due to the wise perception of the particular advisors.

Any interested official may make an initial start by merely talking—talking until he has attracted a group of persons who are sympathetic and willing to co-operate. I do not mean to be so naïve as to say that anyone at any time may succeed in perpetuating his start. Times must be "ripe"; moments must be "psychological." It never does any harm to *try*, however, and, unexpectedly, the iron does become hot, the moment is propitious.

In *The Proceedings* of 1931 of the American Student Health Service Association, the Committee on Correlation of Physical Welfare Activities lists in its report 15 different college and university departments which are in whole or in part interested in health and are performing fragmentary services. The committee makes the following suggestions as to how to make a start with recommendations as to ultimate organization:

"... it is suggested that correlation of these widely scattered services be obtained through the organization ... of an Advisory Health Council or Advisory Committee on Health—this council or committee being composed of representatives appointed yearly from the 15 or more departments interested in health. This Council or Committee should in no sense be an administrative unit; but simply an advisory and correlating unit."

The establishment of an advisory committee having been accomplished, this committee should proceed to study the campus situation. The report mentioned goes on to say:

"The activities and interests of the Student Health Service, the department of Physical Education, the department of Intramural Sports and Recreational Activities, the department of Hygiene, the department of Mental Hygiene, the department of Intercollegiate Athletics, and the Rooming House Inspection Service are all so closely related that it is suggested that they be administratively unified in a Division of Health and Recreation, the director of which will be directly responsible to the president of the institution."

The secret of success of such a council or committee is that the chairman shall have the vision of the whole and that the members of the committee shall be imbued with enthusiasm for health and enthusiasm for student welfare. The initiative in securing the formation of such a committee can be taken by any member of any department (*via* the administrative head of the institution, of course).

After the committee is formed, it should spread out a plan for an ideal health service, taking any compre-

hensive existing plan or making up one of its own, and then it should see what component factors may be available, and especially it should study the matter of integration, and the matter of filling in the weakest and the most salient places.

Leadership will naturally inhere in the strongest focus of interest in health. If the strongest unit in organization, equipment and interest and the oldest in service is the department of physical education, it may happen that the first medical examination may be in the nature of a hasty examination of hearts preliminary to enrollment in gymnasium work and competitive athletic events. Mere human interest in the screenings should lead to ultimate extension of the medical examination service, and I have seen it so happen. An intelligent structural examination leads to a strong realization of the need of medical service.

If the school of home economics is doing vitalized teaching, the resultant interest in the nutrition of individual students will show states of nutrition which are so linked up with physical conditions of medical implication, with curriculum load, with emotional stress, that the full Health Service program could be demanded and, given leadership, might come trailing in the wake of a course in nutrition and the chemistry of food. Case study of any one class or any one group may set the pattern and act as leaven which sooner or later will give character to the organization pattern of the institution.

VI. *The Difficulties.* One of the first difficulties and one which usually forever limits, hampers and restricts the realization of the ideal is *the cost*. There is just one universal rule of successful procedure in the development of anything new and that is *go just as far as possible without definite funds*. Exhaust volunteer effort, and manage somehow to make initial demonstrations as to the exigencies of the situation and the technic of procedure. It is altogether right that public money should be expended only upon well-defined and non-experimental bases. Subsidies, even, can appropriately be used for investigation and demonstration only after the local interest has crystallized to the extent of clearly defining the situation and with the definite certainty of co-operation and support. In our own University of Kansas we have a brilliant example of this sequence in the evolution of the medical service. I have personally seen it grow from the hasty routine heart examination mentioned and a six-bed fire-trap of a cottage hospital serviced by a part-time local physician; pass through two terrifying flu epidemics, to arrive eventually at so complete a demonstration of need and so convincing a plan, that one of the finest hospitals in the country, built by voluntary subsidy, stands upon our campus.

Having assembled such parts or fragments of health service as may be contributed by the departments represented in the advisory health council, and having determined whether this service, partial as it must be at first, will be extended to all, or to selected students only, means for financially supplementing volunteer service will have to be considered. If, as is usually the case, it is medical service which is lacking, means must be found

for raising a small fund, by donation, subscription or subsidy, to command some part of the time of a local physician. Probably the great majority of student health services start with a part-time medical service. After the value of such a service has been demonstrated to the student, he will usually be willing and in the end may be required personally to pay for part or all of value received.

Intelligence tests can commonly be commandeered from the departments of psychology and education. The personal councilor must have his advance agent in the wisely selected faculty advisor. The physical education department is usually fairly well equipped and the members of the staff are usually co-operative in contributing their share of physical evaluation, but are not always willing to sacrifice enough of their historically entrenched independence to become incorporated in an integrated program. (Also, athletics may dominate the other aspects of physical education and the "education" factor may trail far behind the "glory of Alma Mater.")

One of the real essentials which it is difficult to secure from volunteer sources is competent and sufficient *clerical service* for making the tabulations and unified records which furnish the very framework of support and the machinery for the functioning of the entire project. Now and then the various records, if carefully planned and carefully kept, may be used as thesis or project material by students in statistics or educational research. It is worthwhile to consult instructors in such courses and see what arrangements may be made in this direction. The possible utilization of the time of scholarship students will occur to all. It occasionally happens that the head of one of the "15 departments" will find it possible to contribute part of the time of a departmental secretary.

One of the first essentials of even a fragmentary health service is *the nurse*. Dispensary service frequently starts with one trained nurse, who refers individual cases, as indicated, to local physicians for personally paid service. Money must be raised any way possible for the initial demonstration, after which the nurse becomes as much a matter-of-course staff member as the teacher of English or French.

All of this, of course, is greatly facilitated when the head of the institution has a vision of the whole and, especially, if he has back of him an enlightened governing board. The real challenge to individual initiative and resourcefulness comes when the executive head and executive board must be "sold to the idea." Very careful, clear and definite units of demonstration, with clear outlines of purpose and plan will then be necessary—and a course in the psychology of salesmanship will help much!

As to personnel—again the necessary procedure is from the volunteer to the paid. Since the character of the personnel determines explicitly the character and success of the work, the selection, especially of persons in key positions, is critically important. It is essential that the head or even the temporary leader shall have a broad perspective of the whole field, that he shall be a

person as free as is humanly possible from prejudices and peculiarities. Technical and scientific preparation of a high order are, of course, fundamental. *Preparation, however, must never overshadow personality.* It is often much easier to command the preparation than the desirable personality, as will be apparent if one thinks of the members of any medical graduating class.

As to whether the head should preferably be the psychiatric councilor, the college physician who is usually also the medical examiner, the head of physical education, or the personal hygiene teacher—unhesitatingly I say it should be the one having the broadest perspective and the most thoroughgoing scientific preparation plus quality of leadership. Actually all four of these officials frequently have, perhaps all should have, medical degrees. A determining factor may be the particular physical location of the service. If the offices and equipment are located in the students' hospital, the medical head of the hospital is the logical director of the service. In this case, the advisory council may have to watch that interest in diagnosis and treatment of diseases does not overshadow health education and conservation of personality.

If the head of physical education is medically trained, he may have by far the best perspective, and it not infrequently happens that the entire health service, with the exception of care of actual illness, may in the beginning be housed in the gymnasium. In some very good health services, the office of the college physician and the dispensary will be found here.

A medically-trained psychiatrist should be the best prepared of all properly to evaluate all the factors determining the success or lack of success of each and every student.

On the other hand, the health education specialist may have not only perspective, but have the most effective personal contact, and should have an aggressively constructive point of view and have peculiar interest in "positive health."

So there you are! At least all should co-operate as one person, and the advisory council should be the tail which balances and stabilizes the kite. After all, continuous forward movement is rare. Spurts of enthusiasm on the part of newly-established committees is apt to be followed by periods of lethargy and inactivity when the energy of the leaders is drawn into compelling personal channels, or when the real leader may drop out, or when things seem to be going very well and the council takes a well-earned sleep!

This situation may easily lead to disaster. It must not be forgotten for one moment that the thing we are considering ramifies into the entire life of the entire campus. It should be as vital, as perpetual, as evident as is the beating of the heart or the breathing of the lungs, and ever and always it must be kept balanced. If the quality of health education slumps, or the personal councilor sees a grand opportunity to collect psycho-analytic data for a report, a screw drops out of the machine, and engine trouble starts. Ever the objective must be a unity—a "whole."

Summary

The thing of primary importance is the seeing that health is a quality of the whole personality. Every part of every organism responds to every experience. Each individual fits into his environment as an organic part of an organized universe. Life should be a search for unity.

Education is becoming directed living rather than formalized instruction. The student health service must promote this scheme of integrated living by taking care of student environment and by evaluating the student physically, mentally and emotionally and by realizing a unified picture of him which may serve as a guide in directing his academic program. It should carry on research. It should assume ever-increasing importance in the field of higher education in applying scientific knowledge to personal, practical living.

CASE REPORT

A CASE OF UNRESOLVED STREPTOCOCCIC PNEUMONIA

This patient, 21 years old, male, six feet one inch tall, normal weight 170 pounds, was operated on for acute appendicitis under local anesthesia, in another city. During his convalescence he developed a pneumonia of the right lung. Resolution did not take place. Exploratory punctures were made but no pus was found. His condition did not improve. The operation was performed early in April, 1935, and in May he was brought to his home in this city and placed under the care of a physician, who had him under observation during the summer, and in August turned the case over to me as one of tuberculosis.

I found the patient in bed, propped up with pillows. He was extremely emaciated, and unable to sit erect without support. The entire right lung was absolutely dull to percussion and only a few breath sounds could be heard.

The left lung was clear and the pulse of fair strength. He had a frequent cough, only slightly productive. Appetite poor.

He was held under observation for two or three days, during which time he ran a typically hectic fever. Subnormal in the morning, his temperature would rise in the late afternoon to 102.5 to 103.5 F., followed by a drenching sweat. After this period of observation, he was taken to the hospital for further examination. X-ray confirmed the physical findings. The right lung was seen to be completely solid. His weight was now 97 pounds. His sputum showed a pure culture of streptococci. Following these tests he was returned home.

In view of the failure of preceding therapeutic efforts, I decided to use a streptococcus vaccine, prepared for intravenous administration. The results were dramatic. A short time after the first injection he had what, from his description, was a rather severe reaction consisting chiefly of a chill and a "loosening of the cough." The following day his temperature was less and his sweat was moderate. The third or fourth day the afternoon temperature was normal. Five or six injections were given at intervals varying from three days at first to a week for the last two. His appetite returned and in a month his lung was cleaned up. In October he was about the streets and his weight was up to 160.

Inasmuch as this case was treated at home, and in rather a poor home, accurate daily reports were not kept. The interval

between injections of the vaccine were determined by the condition of the patient as it presented, rather than by fixed schedule. Other treatment consisted only of rest, fresh air, and proper nourishment.

Conclusions

There are two obvious conclusions to be drawn from the above.

FIRST: From viewpoint of diagnosis the affected lung was more solid than would be ordinarily the case in the tuberculosis of sufficient severity to have produced the hectic fever, emaciation, and the accompanying conditions.

SECOND: The use of streptococcal vaccine was logical and in this instance startlingly successful.

C. C. WALLIN, M.D.,
Lewistown, Mont.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON FEBRUARY 6, 1937 (JANUARY EXAMINATION)

Name	School	Address
Aanes, Almer Russell	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Adams, Richard Charles	Queens U., M. D., 1931	Mayo Clinic, Rochester, Minn.
Allen, Herbert Benjamin	U. of Minn., M. B., 1936	Northwestern Hospital, Minneapolis, Minn.
Anderson, Wallace Everett	U. of Minn., M. B., 1933, M. D., 1934	Midway Hospital, St. Paul, Minn.
Autry, Daniel Hill	U. of Ark., M. D., 1934	Mayo Clinic, Rochester, Minn.
Benson, Kenelm Winslow	U. of Pa., M. D., 1934	Mayo Clinic, Rochester, Minn.
Benton, Paul C.	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Berman, Lawrence	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Brown, Milton G.	U. of Minn., M. B., 1926, M. D., 1927	1789 Munster St., St. Paul, Minn.
Brussell, Albert Sinai	U. of Minn., M. B., 1933, M. D., 1936	Co. 1774, V. C. C., Rochester, Minn.
Bushard, Wilfred Joseph	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Butler, Raleigh Virgil	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Chermak, Francis Gordon	U. of Minn., M. B., 1936	St. Mary's Hospital, Minneapolis, Minn.
Cowan, George Morterud	U. of Minn., M. B., 1936	St. Mary's Hospital, Duluth, Minn.
Davies, Benjamin Paul	U. of Kansas, M. D., 1931	University Hospital, Minneapolis, Minn.
Dearing, William H., Jr.	U. of Pa., M. D., 1934	Mayo Clinic, Rochester, Minn.
Deters, Donald Cummings	U. of Minn., M. B., 1936	Broadlawn Gen. Hospital, Des Moines, Ia
Enroth, Oscar Ernest	U. of Minn., M. B., 1936	Bethesda Hospital, St. Paul, Minn.
Ershler, Irving	Geo. Wash. U., M. D., 1931	Mpls. Gen. Hospital, Minneapolis, Minn.
Frank, Leonard Charles	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Friedell, George	U. of Minn., M. B., 1936	Ancker Hospital, St. Paul, Minn.
Gorenflo, Leila Ann	Rush Med. Col., M. D., 1935	Cass Lake, Minn.
Gregg, Robert Ober	Syracuse U., M. D., 1934	Mayo Clinic, Rochester, Minn.
Hall, Harry Benjamin	U. of Minn., M. B., 1935, M. D., 1936	University Hospital, Minneapolis, Minn.
Hammerstad, Lynn M.	U. of Minn., M. B., 1935	Heron Lake, Minn.
Hendrick, John Alexander, Jr.	Tulane U., M. D., 1935	Mayo Clinic, Rochester, Minn.
Hertz, Charles Schaeffer	U. of Pa., M. D., 1934	Mayo Clinic, Rochester, Minn.
Jensen, Russell Maben	Northwestern U., M. B., 1935, M. D., 1936	Mayo Clinic, Rochester, Minn.
Kern, Maximilian Christian	Creighton U., M. D., 1936	Gillette State Hospital, St. Paul, Minn.
Kooiker, Clarence	U. of Minn., M. B., 1936	Swedish Hospital, Minneapolis, Minn.
Lloyd, Samuel Joseph	Johns Hopkins, M. D., 1934	Mayo Clinic, Rochester, Minn.
Lovlace, William Randolph	Harvard U., M. D., 1934	Mayo Clinic, Rochester, Minn.
Matthews, Morgan Whitsitt	Tulane U., M. D., 1927	Mayo Clinic, Rochester, Minn.
Mecray, Paul Mulford, Jr.	U. of Pa., M. D., 1934	Mayo Clinic, Rochester, Minn.
Moore, Ferrall Harmon	U. of Neb., M. D., 1932	Mayo Clinic, Rochester, Minn.
Mundell, Benjamin James	Georgetown U., M. D., 1934	Mayo Clinic, Rochester, Minn.
Noran, Harold H.	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Ransom, H. Robert	U. of Minn., M. B., 1936	University Hospital, Minneapolis, Minn.
Rasmussen, Theodore Brown	U. of Minn., M. B., 1934, M. D., 1935	Mayo Clinic, Rochester, Minn.
Reed, Paul	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Regan, James Francis	U. of Chicago, M. D., 1934	Mayo Clinic, Rochester, Minn.
Richardson, Frank Lloyd	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Sawyer, Malcolm Herbert	Northwestern U., M. B., 1935, M. D., 1936	Mayo Clinic, Rochester, Minn.
Seitz, Sherwood Bretz	Northwestern U., M. B., 1935, M. D., 1936	Fairview Hospital, Minneapolis, Minn.
Seljeskog, Sigsbee R.	U. of Minn., M. B., 1936, M. D., 1936	5237 42nd Ave. S., Minneapolis, Minn.
Shandorf, James Frederick	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Smith, Frederick Abbott	U. of Minn., M. B., 1936	St. Barnabas Hospital, Minneapolis, Minn.
Snyder, John Mendenhall	U. of Pa., M. D., 1934	Mayo Clinic, Rochester, Minn.
Spittler, Russell O.	U. of Minn., M. B., 1932, M. D., 1933	5013 Bryant Ave. S., Minneapolis, Minn.
Stanford, Charles Edward	U. of Wisconsin, M. D., 1934	515 Delaware St. S. E., Minneapolis, Minn.
Swingle, Hugh Franklin, Jr.	Duke U., M. D., 1935	Mayo Clinic, Rochester, Minn.
Thysell, Desmond Milton	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Varco, Richard Lynn	U. of Minn., M. B., 1936	Mpls. Gen. Hospital, Minneapolis, Minn.
Wood, George Howard	U. of Cincinnati, M. B., 1934, M. D., 1935	State Hospital, Rochester, Minn.
Wrork, Donald Holly	Northwestern U., M. B., 1934, M. D., 1935	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Miller, Joseph Matthew	Columbia U., M. D., 1935	Mayo Clinic, Rochester, Minn.
Plowman, Elven Theodore	U. of Iowa, M. D., 1930	Marble, Minn.

NATIONAL BOARD CREDENTIALS

Smith, Stanley Joseph	Northwestern U., M. D., 1931	Eveleth, Minn.
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MINNEAPOLIS, MINN., APRIL, 1937

Early Diagnosis and the Eradication of Tuberculosis

For some years this country has witnessed an increasingly successful campaign aimed at the eradication of tuberculosis in cattle. "Eradication" is the word, and the United States Department of Agriculture has not hesitated to use it. The physician, dealing with tuberculosis in man, has been more cautious, speaking of control rather than eradication, just as he avoids the use of "cure" and uses "arrest."

The phenomenal success of the cattle anti-tuberculosis campaign should be an object-lesson to physicians. It is based upon two principles, *viz.*, that tuberculosis is a contagious disease and that removal of infected cattle will stop the disease at its source.

It is now apparent that eradication of tuberculosis in man, in communities that will make a comparable effort, is by no means an unreasonable goal. Methods quite analogous to that used in cattle are available for man, and available in a state of great refinement. Early discovery, early treatment, early education to prevent in-

fection of contacts, will accomplish everything achieved by early discovery and slaughter in cattle. Reach the people and find the cases and spread of the disease can be prevented. The crux is early diagnosis.

During the month of April the tuberculosis associations all over our country are emphasizing the seriousness of that age-old disease that still carries off the flower of our nation. They are urging people to see their family physicians for thorough examination, including chest X-rays, if they seem to be indicated. Radio broadcasting, public addresses, motion pictures, window displays and posters are all being offered the public. If one form of attack does not succeed, they hope another will. This year's Early Diagnosis Campaign offers another chance for the fine co-operation of Tuberculosis Societies and physicians all over our country.

ESMOND R. LONG, M.D.,
President,
National Tuberculosis Association.

AN IMPRESSIVE TEACHER

Those who attended Harvard at the turn of the century will never forget FRED SHATTUCK. When he popped into the arena of the Massachusetts General Hospital to give a clinical lecture, the air was fairly electrified by his dynamic personality. The coat tails of his cutaway, that often found such difficulty in keeping up with him during ward rounds, subsided as his theatrical entrance came to a momentary standstill before the patient who had been wheeled in for demonstration. If his catapult arrival à la MAY ROBSON in the first scene of "The Rejuvenation of Aunt Mary," did not impress the assembled multitude, there still was the inescapable matter of a very red vest to dazzle the eye.

From the colorful setting the amphitheater resounded with the opening sentence designed to insure attention by its sudden and dramatic explosion: "Gentlemen, this man escaped the surgeon's knife like the bird the snare of the fowler." He went on to relate how the patient had been admitted to the surgical section because of pain in the upper right abdominal quadrant and was about to have a gall bladder operation, when a herpes labialis appeared. The students were further informed concerning the pulse, a slight elevation of temperature, and some stiffness of the muscles about the neck.

After sallies back and forth, he enthusiastically appealed for a recognition of what he would have them see in this picture. With out-stretched hands he pirouetted about, pleading for someone to venture a diagnosis; and a pointing finger finally came to a standstill in the face of a post-graduate student, vulnerably exposed on a front seat: "You, Sir!"

The astonished P. G. resolved to try his luck with the roulette ball that had so unexpectedly fallen in his lap and modestly suggested that it might be cerebrospinal meningitis.

"What kind? What kind? Simple or tuberculous?"

Falteringly the P. G. offered the opinion that it was simple.

"Why? Why? Why? I agree with you; I agree with you; but give a reason for the faith that is within you." Stumped to be sure (for the particular answer wanted); but not to this day have we forgotten the lesson he would teach: that herpes labialis is indicative of an acute rather than a chronic disease.

A. E. H.

THE COLD COMPRESS

The cold compress is a valuable but much neglected remedy. Priessnitz was a farmer and Kneipp was a Catholic priest. Neither of them had a medical education in the ordinary meaning of the term; but they became lesser apostles, so to speak, of modern hydrotherapy. It was Professor Winternitz of Vienna who worked out the reason for their getting results and placed the whole matter on a scientific basis. The time of exposure, relative temperature of the recipient's body

surface to the water, and the force of the accompanying mechanical stimulus were found to be the three most important factors. Kneipp's barefoot walking through the dew laden morning grass had been ridiculed, but Winternitz found that it had an effect so remote as to influence the very capillaries of the brain.

The *Priessnitz umschlage* have been applied to all parts of the body for a variety of conditions such as local fever, pain, insomnia, and to affect metabolic changes by circulatory stimulation or stasis. Because of the oft shown negligence by nurses for the time element, it may be well to instruct them about the difference in results obtained from active and passive reactions. In cases of acute laryngitis they should first apply around the neck a properly folded linen napkin, that has been wrung out of cold water; next to this, a dry napkin; and lastly, something of woolen kind, all snugly pinned. The active reaction takes place in fifty minutes at which time the compress will be found hot, and the procedure must now be repeated unless the passive results be desired.

A. E. H.

JOHN E. ENGSTAD

1858 - 1937

Another veteran has fallen and left an empty space in the rapidly thinning ranks of the pioneer physicians of North Dakota. Dr. J. E. Engstad of Grand Forks, North Dakota, was born in Christiania (Oslo) Norway, May 4th, 1858; and while yet a mere child came with his parents to America and settled at Holman, Wisconsin. He passed away at Grand Forks, North Dakota, February 19th, 1937, in the hospital he founded forty-six years ago. He received his medical degree from Rush Medical College, Chicago, in 1885. Being a pioneer in fact as in spirit, he heard and answered the call of the West and came to the then territory of Dakota, where in his early years of practice he did much hard pioneer work on its prairies.

Dr. Engstad was never too old to be a student. That he might give his patients the best of which he was capable, he made regular visits to the leading clinics at home and abroad, thus perfecting himself in the profession he loved so well. In this way he became widely-known and was recognized as an authority on many branches of medical lore. He was a charter member of the North Dakota Medical Association, and in 1888 was elected its secretary. He was also a member of the local and national medical societies and for eight years operated St. Luke's Hospital, the first of its kind in the state. He brought to Grand Forks the first X-ray machine and the first blood pressure instrument to be used in the state, both of which are now in the State Historical Museum at Bismarck.

Dr. Engstad was a ready and versatile writer on medical and surgical subjects, his articles appearing in the leading professional journals of the country, and was a member of the American Medical Editors and Authors Association. He was also a frequent contributor to the

CAT.

lay press on a variety of subjects of more or less general interest. He was of a mechanical bent of mind and being ambidextrous, developed a surgical technic that was outstanding. In this connection, he devised means and methods that have become the common property of the profession. His keen, intuitive mind could sense the fitness of things and shed light on obscure or intricate conditions. To this in large measure was due his resourcefulness and skill as a surgeon. In an age marked by individualism, it was inevitable that steel would meet steel, but these trivial clashes, important as they seemed at the time, when viewed in the mellowing perspective of half-a-hundred years, appear as mere love-pats that brought to the fore the best of brain energy and service.

Dr. Engstad was a lover of the beautiful in nature and in art. He traveled far, and in his trip around the world made a collection of rare and beautiful paintings and objects of art that were sources of pleasure and satisfaction not only to himself and family, but to the community as well; for he delighted in sharing with others the treasured fruit of his gathering.

Dr. Engstad was the most genial of companions, warm and sympathetic in his friendships, devoted to his home and family, kind and considerate to his patients and true to the faith of his fathers. As we pay this parting tribute, the freed pioneering spirit with the forward look, signals back:

"Say not good-night, but in some brighter clime
Bid me good-morning."

J. GRASSICK, M. D.
Grand Forks, N. D.

SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

Annual Meeting, St. Paul, May 3, 4, and 5, 1937

A large public health meeting will be one of the features of the 84th Annual Meeting of the Minnesota State Medical Association to be held at the St. Paul Auditorium, May 3, 4 and 5.

The meeting is scheduled for Tuesday evening in the Auditorium Theater.

Rev. Alphonse M. Schwitalla, S. J., St. Louis, Missouri, president of the Catholic Hospital Association and dean of the St. Louis University Medical School will appear on the program; also Dr. Nathan B. Van Etten, New York City, speaker of the House of Delegates of the American Medical Association; Dr. R. A. Vonderlehr, Washington, D. C., assistant surgeon general, United States Public Health Service, and Dr. Morris Fishbein, Chicago, editor of *The Journal of the American Medical Association*.

Dr. Van Etten will speak on "The Medical Citizen." He will also speak before a general session of the Association Tuesday afternoon in connection with a symposium on medical economics. At that time his subject will be "Medical Care for All Americans," and Dr. Maxwell J. Lick, Erie, Pennsylvania, president of the



Dr. Maxwell J. Lick
Erie, Pa.



Rev. Alphonse M. Schwitalla, S. J.
St. Louis, Mo.

Medical Society of the State of Pennsylvania, will speak on "The Doctor Looks at Social Security."

"Quacks of the Last Year" will be Dr. Fishbein's subject at the public health meeting. Both Dr. Fishbein and Rev. Schwitalla will take an active part in the Congress of Allied Professions to be held throughout Monday in connection with the annual meeting.

Dr. Lick will also be one of the speakers for the Northwest Industrial Medical Conference to occupy the third day of the meeting. Talks on subjects especially pertaining to medicine in industry will form the third day of the scientific program. Medical and surgical sections, which will hold separate sessions during the first two days of the meeting will unite for this program. The Conference has also been designated as the annual meeting of the Great Northern Railroad Surgeons because of the important topics to be discussed.

Clinics Monday and Tuesday mornings will begin the program on those days. There will be several question panels on various subjects also included on the program. An hour's time each morning and afternoon will be devoted to inspection of exhibits and scientific demonstrations.

OFFICIAL CALL SOUTH DAKOTA STATE MEDICAL ASSOCIATION

To the officers and members of the South Dakota State Medical Association:

The Fifty-sixth Annual Session of the South Dakota State Medical Association will be held in Rapid City, S. D. from Monday, May 24, to Wednesday, 26, 1937.

Headquarters Alex Johnson Hotel.

The Council will convene on Monday, May 24 at 4:00 P. M. Alex Johnson Hotel.

The House of Delegates will convene on Monday, May 24, at 7:00 P. M. Alex Johnson Hotel.

The Scientific program will open on Tuesday, May 25, at Alex Johnson Hotel.

Annual Banquet May 25, 7:00 P. M., Alex Johnson Hotel.

Second meeting of House of Delegates May 25, following banquet, at 10:00 P. M.

Wednesday, May 26, Program—Drive through the interesting portion of the Hills. Luncheon at Noon with a program at Sanator.

Wednesday, May 26, Second meeting of Council.
6:30 A. M. Breakfast. Alex Johnson Hotel.

J. L. Stewart, M. D., President

Nemo, S. D.

H. R. Kenaston, M. D., Chairman Council
Bonesteel, S. D.

Attest:

J. F. D. Cook, M. D., Sec'y-Treas.

Langford, S. D., April first, 1937.

TENTATIVE PROGRAM THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Rapid City, May 24, 25, 26, 1937

Headquarters—Alex Johnson Hotel

MONDAY, MAY 24—

4:00 P. M. First meeting of Council.

7:00 P. M. First meeting House of Delegates.

TUESDAY, MAY 25, Scientific program.

8:00 A. M. Medical Clinic—"Biliary tract diseases."
Albert Markley Snell, M. D., Rochester,
Minn.

9:00 A. M. Orthopedic Clinic—"Fractures of Neck
Femur," Myron Ornell Henry, M. D.,
Minneapolis, Minn.

10:00 A. M. 15 minutes intermission—Visit exhibits.

10:15 A. M. Surgical Clinic—"Cancer of the Colon,
Sigmoid and Rectum," Claude Frank
Dixon, M. D., Rochester, Minn.

11:15 A. M. Pediatric Clinic—"Nutritional Problems
in Childhood," George Edward Robertson,
M. D., Omaha, Neb.

NOON

1:30 P. M. Paper—"Roentgenologic Diagnosis of
Gastro-intestinal Disease," Harry Mathew
Weber, M. D., Rochester, Minn.

2:20 P. M. Paper—"Acute Abdomen," Claude Frank
Dixon, M. D., Rochester, Minn.

3:10 P. M. Paper—"Some Diagnostic and Therapeu-
tic Problems Presented by the Jaundiced
Patient," Albert Markley Snell, M. D.,
Rochester, Minn.

4:00 P. M. 15 minutes intermission—Visit Exhibits.

4:15 P. M. Paper—"Feeding Problems in Infancy,"
George Edward Robertson, M. D.,
Omaha, Neb.

5:05 P. M. Paper—"Use of Bone Chips in Surgery,"
Myron Ornell Henry, M. D.,
Minneapolis, Minn.

* * * *

7:00 P. M. Abbaual Banquet. Alex Johnson Hotel.

10:00 P. M. SECOND meeting of House of Dele-
gates. (Following Banquet)

WEDNESDAY, MAY 26—

6:30 A. M. Second meeting of Council.

Breakfast—Alex Johnson Hotel.

8:00 A. M. Trip through the most scenic parts of the
Black Hills. Ladies to participate.

12:00 NOON. Luncheon.

1:30 P. M. "The Institutional Care of Tuberculosis
in South Dakota," Floyd S. Coslett,
M. D., Superintendent State Sanatorium,
Sanator, S. D.

2:00 P. M. Paper—"Surgery of Pulmonary Tuber-
culosis," Thomas James Kinsella, M. D.,
Minneapolis, Minn.

3:00 P. M. Clinic—"Roentgenologic Manifestations
of Tuberculosis of the Gastro-intestinal
Tract," Harry Mathew Weber, M. D.,
Rochester, Minn.

* * * *

PROGRAM COMMITTEE

R. E. Jernstrom, M. D., Rapid City, S. D.

D. L. Kegaries, M. D., Rapid City, S. D.

J. L. Stewart, M. D., Nemo, S. D.

J. F. D. Cook, M. D., Secretary, Langford, S. D.

LOCAL COMMITTEES

Room Reservations and Registration—

E. W. Minty, M. D., Rapid City

Exhibits—D. L. Kegaries, M. D. and F. W. Stevenson,
M. D., Rapid City

Scenic Trip—R. J. Jackson, M. D., Rapid City

Banquet—N. T. Owen, M. D. and R. E. Jernstrom,
M. D., Rapid City

Clinicians:

Dr. Snell—D. L. Kegaries and E. W. Minty

Dr. Henry—W. E. Morse and N. T. Owen

Dr. Robertson—J. D. Bailey and F. J. Radusch

Dr. Dixon—W. A. Dawley and F. W. Minty

MAKE YOUR HOTEL RESERVATIONS EARLY
THROUGH THE LOCAL COMMITTEE.

J. F. D. Cook, M. D., Secretary

Langford, S. D., April 1, 1937

TENTATIVE PROGRAM SOUTH DAKOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY RAPID CITY, SOUTH DAKOTA, MAY 25th, 1937.

Headquarters Alex Johnson Hotel

Meeting Place—Auditorium—Dakota Power Co.

OFFICERS

A. Einar Johnson, M. D., President.....Watertown, S. D.

T. C. Nilsson, M. D., Vice-President.....Sioux Falls, S. D.

H. L. Saylor, M. D., Secretary.....Huron, S. D.

SCIENTIFIC PROGRAM

9:00 A. M. "Diagnosis and Surgical Treatment of Strabis-
mus," Avery D. Pragen, M. D., Rochester,
Minn.

10:00 A. M. "Moot Questions in Cataract Surgery."
J. J. Hompes, M. D., Lincoln, Neb.

11:00 A. M. "Significance of Chronic Hoarseness."
Harry B. Stokes, M. D., Omaha, Neb.

**WOMEN'S AUXILIARY
to the
SOUTH DAKOTA STATE MEDICAL
ASSOCIATION
1910—1937**

The Women's Auxiliary will meet at Rapid City, South Dakota, May 24-25-26, 1937 at the time of the State Medical Association meeting. Greetings to the members and friends of the South Dakota State Medical Auxiliary.

It is indeed a pleasure to welcome you to the twenty-seventh annual meeting and particularly so because we shall meet again in our beloved Black Hills, where the Medical Auxiliary had its beginning.

Let us make this an occasion for rejoicing, not only because of our past achievements but because of the opportunity it presents for planning bigger and better things in the future.

Sincerely,
Florence B. Nessa, President
Sioux Falls, S. D.

**TENTATIVE PROGRAM
for the
NORTH DAKOTA STATE MEDICAL
ASSOCIATION
ANNUAL MEETING
To Be Held in
Grand Forks, May 16, 17, 18.**

The 50th annual meeting of the North Dakota State Medical Association will be held at Grand Forks in the new auditorium of Central High School on May 16, 17, and 18, 1937. Commercial and scientific exhibits will be held on the lower floor, and those who desire booth space at this meeting should communicate with Doctor R. E. Leigh, 101 North 3rd Street in Grand Forks, who is chairman of exhibits.

Speakers on the program will include: Doctor Donald C. Balfour, Rochester, Minn.; Doctor Robert Daniel Mussey, of Rochester, Minn.; Doctor George Albert Williamson, of St. Paul, Minn.; Doctor E. L. Tuohy, of Duluth, Minn.; and Doctor John Silas Lundy, of Rochester, Minn.

Members of the North Dakota State Medical Association who are on the program comprise these physicians: Doctor H. Milton Berg, of Bismarck; Doctor Kent Darrow, of Fargo; Doctor Willard Arthur Wright, of Williston; Doctor Reuben Herman Waldschmidt, of Bismarck; Doctor William H. Long, of Fargo; Doctor Reinhold O. Goehl, of Grand Forks; Doctor William Crane Nichols, of Fargo; Doctor Glenn William Toomey, of Devil's Lake; and Doctor A. D. McCannel, of Minot.

The House of Delegates will meet at 2:00 P. M. on May 16. The scientific program will commence at 9:00 A. M. on May 17. The annual banquet will be at 6:30 P. M. on May 17. Other entertainment has been scheduled.

**SCIENTIFIC PROGRAM OF THE
MINNEAPOLIS CLINICAL CLUB**

Thursday, December 10, 1936

Dr. Donald McCarthy, President

* * *

**CASE HISTORY AND DIAGNOSIS
ADENOCARCINOMA OF THE PARATHYROID
GLAND WITH HYPERPARATHYROIDISM**

Dr. Norman Johnson

On August 6, 1935, Mr. Geo. C. presented at my office at the instigation of a benefit organization to determine whether he was both totally and permanently disabled. He was then 48 years of age, a railroad engineer, who had been unable to work since June, 1933. He complained as follows:

For two years there had been a gradual and progressive muscular weakness which began with pain in his feet on walking and with weakness in his back. At the present time he required a cane to steady himself when he walked and reported that in the dark he could not get about. He also recited that in the last few years his eyesight had begun to fail and his hearing to become less acute. He can read with glasses but he cannot see across the street. The eye movements are sometimes difficult and painful and he complains of aching of the eyes and of transient attacks of dizziness. He reports tenderness in all of his joints and along the bones and a loss of weight from a normal at 195 pounds to his present weight of 142. He is also troubled with nocturia three or four times, and on some nights, every hour, and with some frequency during the day. His strength has so diminished that he can no longer carry a market basket from the store. He ceased ordinary work in June, 1933, because he was no longer able to pull himself into the cab. After a few drinks on New Year's Eve in 1934 he admits that he was absolutely "down and out" and the condition has gradually been getting worse since.

In his past history are two important periods of hospitalization. In 1925 he was a robust individual carrying about 200 pounds, well distributed over a five feet 11 inches height. Shortly after, he began having attacks of severe colicky pain, several hours in duration, usually in the left flank or left abdomen. These attacks were not frequent but were definitely disabling. During one of these attacks in early December, 1931, following an investigation by cystoscope and X-ray, he did pass a kidney stone about the size of a pea. Because of a finding of RBC and WBC, hyalin and granular casts, and of X-ray evidence indicating stones in the kidney, he was hospitalized and operated on December 8, 1931. Though most of his pain had been on the left side, the right kidney was removed. He was discharged December 23, 1931. The hospital chart for this period shows the following significant findings:

URINE:

Eleven urinalyses recorded.

Specific gravity 1007 to 1014 in all.

Albumin—Present in several, none in last three.

Sugar—None.

Microscopic—Occasional hyalin casts and granular casts. No RBC after December 11. Intermittent finding of WBC. One week p.o. there were 30-40 pus cells. Two weeks p.o. 1-2 WBC.

BLOOD AND BLOOD CHEMISTRY:

Hemoglobin—97 per cent.

WBC—12,900.

Creatinin—2.34 mgs. 2nd day p.o.; 1.92 mgs. 3rd day p.o.

Urea—39.9 mgs. 2nd day p.o.; 46.2 mgs. 3rd day p.o.

PATHOLOGICAL REPORT:

Kidney—15x7x4 cm. Dilatation in the upper pole. Calices contained fine and coarse granular material and stones. Thickening of the capsule. Congested glomeruli. Thickening and hyalinization of Bowman's capsule. Cloudy swelling of the tubules.

PATHOLOGICAL DIAGNOSIS:

Parenchymatous degeneration.
Diffuse interstitial fibrosis.
Obliteration of the medium and smaller vessels.
Hyaline degeneration.

Post-Operative Notes

He was said to have had nephritis in the remaining kidney with edema of the feet and ankles which was considered permanent at the time. He was discharged weighing 145 pounds, having had a temperature fluctuation between normal and 100.2, even up to the day of discharge.

The patient states that he made a good recovery following this operation, was able to return to his work, and felt quite well until the present complaint began with painful feet and weakness in the back muscles some time early in the year 1933.

His second hospitalization in different hands occurred between February 17 and March 30 of 1935. This entry was because of marked physical weakness and a severe anemia of the secondary type. Physical examination at this time failed to reveal any cause for weakness. There was marked muscle wasting and pallor of the membranes. He had great difficulty in sleeping, voided frequently at night, and on six occasions vomited.

Laboratory Reports

BLOOD:

Averaged a little over 3,000,000 red cells with hemoglobin between 60 and 70 per cent. No report on morphology of the cells.

BMR:

Minus 9.

WASSERMANN:

Kolmer and Kline negative.

X-RAY:

By fluoroscopy only—therefore no record except by written report. The following findings were perhaps noteworthy. "A triangular shadow in the upper chest having its apex at the aorta and its base toward the neck. Heart and chest otherwise clear." Barium by the mouth showed some pyloro-spasm and pressure, probably from an extrinsic source, along the lesser curvature of the duodenum. There was retention of barium. Colon enema was negative.

URINALYSES:

Negative except for persistent low gravity—1004 being the highest.

Physical Examination

Enlargement of the neck noticed for eight months. A nodule present in the right lower thyroid lobe. Systolic bruit at the apex. Blood pressure 138/106. Pulse 88, regular. Pain and tenderness both insteps, both ankles, backs of the legs and knees. Had excellent appetite. Voided frequently at night. Great difficulty in sleeping. Pulse averaged from 70 to 90 during his hospital stay. Temperature as high as 99.4. Was given ventriculin grams X t.i.d. and liver extract (1 ampule) every other day as the only medication. Discharged without improvement in the blood or any of his symptoms. Apparently no attempt was made to study blood chemistry, kidney function, or to follow up the X-ray findings of the shadow in the upper chest and the deformity in the stomach.

Six weeks later his hemoglobin was 60, RBC 3,100,000, leucocytes 9,200. Urine showed RBC and WBC, three plus albumin. Sugar reduced with nine drops and polyuria was reported. A diagnosis was then made of nephritis of the remaining kidney and of "diabetes encephalitis."

One month later he was somewhat improved but still showed sugar in the urine. The hemoglobin was 70, red count 4,000,000. Hospitalization at this time was refused. Two months later he reported to me for the first time and was hospitalized by me from October 29 to November 2 for study.

The complaints were essentially those of the past several years, only more severe. In the order of importance in the patient's mind, they were as follows. Tremendous muscular weakness and loss of weight from 200 pounds to 142. Difficulties in locomotion resembling an ataxic paraplegia. Spasms of dizziness or giddiness and visual difficulties. It was also brought

out that his original height of five feet 11 had shrunk to about five feet eight when measured in his slippers. There was a noticeable kyphos and some anterior bowing of his lower extremities.

Physical Examination

He stands with his feet wide apart and when he walks he helps himself with his eyes on the ground and a cane extended laterally. There is noteworthy muscle atrophy fairly evenly distributed throughout. The skin shows a papular acne-form outbreak over the chest but is otherwise negative. The nails are negative. Pupils react to light and distance. Ophthalmoscopic examination shows a retina beyond reproach though the arteries perhaps are smaller than normal. They are not tortuous or beaded and the arterio-venous crossings are not obliterated. There was no evidence of retinitis, old hemorrhage, or exudate. The optic discs on both sides are very pale and very sharply defined, resembling the primary optic atrophy of lues. Though nystagmus was once seen by me I was unable on several occasions to elicit it again. The glandular system, with the exception of the thyroid, seemed negative. Ears were normal, mouth normal. A mastoid scar appears on the left. The right tonsil is present. There is not much tissue in the tonsillar fossa on the opposite side. Tongue moves in the midline and is normal. Patient is edentulous. Membranes somewhat pale. Pressure over all the joints and most of the long bones produces tenderness. The heart was of normal size and shape. A short, sharp, systolic murmur was heard over the apex. Blood pressure was 122 to 130/80. In the three months elapsing between the first office visit and the hospitalization, the adenomatous development in the region of the right lower thyroid pole had enlarged noticeably. There was no tremor of the fingers. Pulse rate remained within normal limits. The chest was clear to all forms of physical examination except for the evidence that the tumor in the thyroid area extended below the right clavicle. There was marked tenderness to pressure applied over the left twelfth rib; whether because of pressure on the bone or on the kidney beneath could not be determined. The abdomen was negative to all investigation. Neurological tests on all four extremities for reflexes, position and muscle sense, sensation, clonus, Babinski, and vibration sense were normal except for a diminished vibration sense in the right leg. There was no asteriognosis; finger-nose test was well performed. No joint swellings appeared. There was a good check reaction in the muscles of the upper arm. The Romberg was slightly positive but was thought to be due to muscle weakness rather than to definite interruption of continuity in the central nervous system.

Laboratory

RENAL FUNCTION:

Urea nitrogen—37.8 mgs.

Creatinin—1.22 mgs.

P.S.P. Test—One hour—130 c.c. 20%

Second hour—130 c.c. 10.6%

Total 30.6%

The entrance urinalysis showed a gravity of 1023, alkaline reaction, albumin 1 plus, sugar none.

Microscopic—A few hyalin and 8-10 granular casts, 30-40 WBC. Pus in clumps.

This is the only record of a specific gravity appearing above 1014 in any hospital record since 1931. On the following day specific gravity was 1013. The other findings were the same. A two-hour water concentration test was well performed and well carried out. Specific gravity ranged between 1011 and 1014. The night specimen averaged 1012. Volume showed 1594 c.c. by day against 1120 c.c. by night.

BLOOD:

Hemoglobin—72 per cent.

RBC—3,400,000.

WBC—8450.

Seventy-six per cent polys; 19 lymphocytes, two large monos, two baso, one eosin.

Morphology not characteristic of pernicious anemia.

Fasting blood sugar was 80 mgs. per 100 c.c.

CLINICAL COURSE:

Temperature varied from normal to 99.4 each afternoon. Pulse rate between 80 and 90. He had not vomited in several months and needed no attention from the nurses except for help in getting from place to place.

COMMENTS:

Syphilis seems definitely to have been ruled out. There was the failure to find lesions or history in the patient, a normal family history, repeated negative blood serology, a lack of evidence of any C.N.S. involvement. Lumbar puncture was not done. It seems apparent that his remaining kidney was deficient in function as evidenced by an elevated urea, a diminished P.S.P. excretion, an inability to concentrate, and the microscopic findings in the sediment.

X-RAY:

Because of overlying gas a single flat plate of the abdomen did not demonstrate the remaining kidney well. However, no stone was apparent and the outline of the kidney seemed normal. A single film of his chest revealed the shadow previously reported in the upper substernal area, triangular in shape, its base toward the neck, apex at the aorta. This shadow is thought to be due to an enlarged thyroid with displacement downward, compression of the trachea on the right side, and tracheal displacement to the left. Near the right axilla, at the level of the third and fourth ribs, was a shadow at first reported as metastatic malignancy, later thought to be due to bone cyst. Osteoporosis was not noted. No X-ray of the stomach was made.

DIAGNOSIS:

The anemia is unexplained unless it be due to a renal deficiency more severe than the present investigation has revealed. The anemia has been remarkably constant over a period of years and did not respond to liver therapy. The vomiting might have been due to urea retention but there has been no history of headache. The loss of weight and height, the remarkable muscle wasting with ataxic gait in the absence of evidence of central nervous system damage, the inability to prove lues in spite of apparent primary optic atrophy, and the previous history of kidney stone, all are unexplained by any adequate diagnosis except hyperparathyroidism. It then seems possible that this supposed adenoma of the right lower thyroid pole may be in fact a parathyroid tumor; or that hyper-functioning of the parathyroid does exist from glands not located by X-ray or palpation. In support of this belief, a blood calcium was done, revealing a level of 13.38 mgs. per 100 c.c., which is approximately 33 per cent above normal. The phosphorus was reported to be 3.46 mgs., distinctly a low normal, though not definitely in the abnormal field. However, in long standing cases it has been reported that the low phosphorus tends to return to a more normal figure. Since it was not my privilege to superintend or advise treatment, but merely to report the cause of disability, I had unwillingly to allow this patient to depart and had no knowledge of him until one year later.

Subsequent Course

In the Mayo Clinic Bulletin for September 30, 1936, Dr. A. M. Snell reported a case of hyperparathyroidism operated at the Clinic. I immediately communicated with him, believing the case to be the same as the one I have just described. Dr. Snell confirmed my suspicions and with the greatest of generosity he has supplied me with all of the Clinic records, including photographs and X-ray material, in order that I may complete this report. This patient entered the Clinic December 26, 1935. In addition to the previously described complaints, he added a sensation of choking in his throat and the element of pain was more obvious than in previous investigations. Physical examination was not far different from that previously described. Polyuria to the amount of three liters a day was present. The entrance urine showed a specific gravity of 1014 with two plus albumin, no sugar, occasional pus cell. The blood showed 11.9 mgs. per 100 c.c. of hemoglobin; 3,100,000 RBC; 7200 WBC; polys 49; monos 2.5; lymphocytes 33; eosinophiles 15.5. The blood urea was 40 mgs.; chlorides 619 mgs.; the CO₂ combining power 43.8 per cent; blood calcium was 14.9 mgs.; phosphorus 2.6 mgs.; phosphatase 24.0; free hydrochloric

acid 32 units; total acid 40 units; blood Wassermann was negative. No explanation for the eosinophilia has been offered.

A urea clearance test was done, resulting in 11.0 c.c. and sulphate clearance 6.2 c.c., both indicating a greatly reduced renal function. A basal metabolic rate was plus 15. The X-ray showed osteoporosis with possible cystic rib changes and spontaneous healed fractures of the ribs. There was a mild osteoporosis of the skull. The ataxic gait was thought to be due solely to weakness. It was graded three. Dr. Wilder suggested the anemia to be due to replacement of the bone marrow by connective tissue.

On December 30, Dr. C. W. Mayo removed the cervical tumor. It is described as an orange size adenoma of the right inferior thyroid pole, discrete, substernal, and retrotracheal. Over it lay a network of veins. It looked different than the usual thyroid adenoma, was soft and a little cystic. The cut surfaces looked like chocolate. A part of the right lower thyroid lobe was removed with the tumor. There was no evidence of tumor on the left and no resection was done on that side. Pathological report of the specimen was as follows:

WEIGHT:

Parathyroid gland, 101 grams, measuring 6x5x5 cm.

Portion of the right lobe, thyroid, 30 grams, 7x3x3 cm.

PATHOLOGICAL DIAGNOSIS:

Colloid thyroid.

Adenocarcinoma of parathyroid gland, graded one.

POST-OPERATIVE COURSE:

No tetany existed but some parasthesias were reported. The calcium dropped to eight mgs. The phosphatase remained high.

The urea on December 30, the day of operation, was 40 mgs.

The urea on January 3, 1936, was 70 mgs.

The urea on January 4, 1936, was 58 mgs.

The calcium on December 28 was 14.9 mgs.

The calcium on December 31 was 10.6 mgs.

The calcium on January 2, 1936, was 8.8 mgs.

The calcium on January 3, 1936, was 8.2 mgs.

The calcium on January 8, 1936, was 8.1 mgs.

Basal metabolic rate on January 7, 1936, had risen to plus 18. Some Lugol's was given but eventually it was discontinued.

The patient was discharged to his home and again reported six months later on July 22, 1936. He then demonstrated an ataxia, graded one, a gain of 40 pounds in weight, a normal blood, and a serum calcium of 9.4 mgs. The phosphatase was normal. X-ray of the long bones was interpreted to show reclassification. His chief complaint was that of painful feet and he exhibited tenderness along the longitudinal arches.

The parathyroid tumor removed at this operation is said by the Clinic to be the largest tumor as yet reported in the literature. In 1936, Dr. Webb reported one about two-thirds this size, and Cope has reported one which weighed 53 grams. Apparently the operation has produced in this patient a remarkable recovery but it is not likely that the damage to the remaining kidney will be greatly improved and the prognosis for the future must be guarded inasmuch as age and intercurrent infections may add to the damage already present in the kidney, where the tubules are probably heavily laden with calcium deposits.

Through the kindness of Dr. Snell and the Mayo Clinic I am enabled to show their photographs of this case.

Discussion

DR. LEO G. RIGLER: This is a very interesting case report and brings to mind a similar case at the University Hospital which is being studied by Dr. Richard Johnson: a woman came into the out-patient department complaining of headaches. She was examined repeatedly and it was found she had a positive Wassermann with other findings which indicated a diagnosis of syphilis, and treatment was started. It was also found that one of her breasts had been removed some ten or 12 years before, and she had some glands in her axilla. She was sent in for examination of the chest to determine whether or not she had metastasis, not knowing from our records whether the tumor was carcinoma or not. X-rays of the lungs revealed tuberculosis and then she was sent in for X-ray examination of the skull because in almost every case of head-

ache we take an X-ray of the skull. It was found she had three areas in the skull which looked much like the metastases which one would get in carcinoma of the breast. She then disappeared, although she was recommended for X-ray treatment. When she returned it was found that someone else had removed these axillary glands and these had proved to be tuberculous. We finally obtained a report of her breast amputation and found she had had a carcinoma. It appeared, therefore, that she had carcinoma, syphilis and tuberculosis. X-ray treatment was started to the skull under the assumption that these were metastases from the carcinoma of the breast.

A film of the pelvis was made which revealed that she had a very large cyst in the ilium which did not look like a metastasis. The picture of the pelvis was entirely different from that of metastasis, having a marked granular appearance. We took films of her entire spine, found numerous kidney stones and, what is more remarkable, an osteoblastic process throughout the thoracic spine, but in addition this marked granular appearance. Her calcium at that time was practically normal, her phosphorus was not decreased. The appearance of the skeleton was so typical that we felt certain she was suffering from hyperparathyroidism in spite of the normal blood findings.

Her blood calcium later rose and it got up to 14.5, well above the normal. With that in mind, further examination was done, and finally a very small nodule was palpated in her neck. She was operated upon and a good-sized tumor of the parathyroid was removed, following which her calcium dropped to normal. Her bone changes have hardly disappeared at all. There is a little change in the skull, but her skeleton has remained very much the same. Her general appearance is very much improved. She still has a moderately active tuberculosis in both lungs and definite clinical syphilis. I thought it was a very interesting case because of the combination of carcinoma, syphilis, tuberculosis, and, finally, hyperparathyroidism.

DR. WALTER FINK: May I ask if the Mayo Clinic threw any light on the primary atrophy you spoke of?

DR. NORMAN JOHNSON: They did not mention it except that in the examination of July 22, 1936, it had apparently disappeared. It was probably due to his anemia and was not a primary atrophy but merely resembled one.

DR. DOUGLAS P. HEAD: Isn't it true that you cannot depend on the blood calcium in these cases, that many of them will have normal blood findings and yet show increased urinary excretion values?

DR. NORMAN JOHNSON: The blood calcium depends on a great many variable things. It depends on the amount of calcium and phosphorus taken in daily and upon the ability of the individual to absorb that intake and upon the reservoir of these minerals which may be well stocked or badly depleted. Therefore, it is rather unwise to base too much upon a single finding. Whenever you do get a calcium above 12 mgs. per 100 c.c. and at the same time a phosphorus below three mgs., it is probably of great significance and hyperparathyroidism should be considered. On the other hand, if either of these two blood elements is normal and the other one deviates in the proper direction, it is also unwise to overlook the possibility of hyperparathyroidism.

DR. LEO G. RIGLER: I think the muscular weakness here particularly should be thought of. That should be emphasized as a very important factor in early diagnosis. Ballin, who saw many cases of hyperparathyroidism, used a muscle tone test as an important factor in early diagnosis.

DR. DOUGLAS P. HEAD: Did you have a picture of the spine taken?

DR. NORMAN JOHNSON: X-rays at Rochester of the spine showed a marked diffuse osteoporosis.

DR. DOUGLAS P. HEAD: How do the X-ray men feel about the relatively common cysts involving only the mandible? How often are they associated with hyperparathyroidism?

DR. LEO G. RIGLER: In the case I described, the patient also had a systic area in the mandible which we had diagnosed from the X-ray examination as a giant cell tumor. A cancer quack burned this out so we could not get any sections to determine what it was. It no doubt was one of these cysts which

might occur in the mandible just as well as anywhere else. Ballin had a number of cases that had been sent in as solitary cysts but on careful examination other cysts were found elsewhere in the skeleton.

ABSTRACT

ROENTGEN DIAGNOSIS OF OCCLUSION OF THE SMALLER BRONCHI

Leo G. Rigler, M.D.

While stenosis of the larger bronchi has been studied intensively both from the clinical and roentgenologic point of view, stenosis of the smaller bronchi has had relatively little attention. The bronchi beyond the second bifurcation are rather frequently occluded, most commonly in association with bronchial asthma, but also as a secondary finding in chronic emphysema, unresolved pneumonia, tuberculosis, syphilis of the lung, pneumoconiosis or as a result of other chronic inflammatory processes.

The occlusion of these smaller bronchi may occur in three possible ways. First, there may be a partial obliteration of the lumen due to an actual hypertrophy of the bronchial mucosa with infolding and extension into the lumen. This occurs rather rarely in asthma. The second is by far the most common form of occlusion and is due to the accumulation of mucous plugs in the smaller bronchi which eventually become hyalinized and produce complete obliteration. This is very frequent in bronchial asthma. The third is by actual infiltration of the outer bronchial wall from parenchymal processes of an inflammatory nature and compression of the bronchi in this fashion.

The occlusion of these bronchi may be demonstrated by bronchography with iodized oil. Great care must be exercised in the technique of the examination so that sufficient time elapses between the time the oil is given and the time the films are made so that there will be an opportunity for the oil to reach the smaller bronchi. If the technical factors are correct, however, and certain areas of the lung field do not show any iodized oil or if certain bronchi fail to fill completely while other bronchi in the immediate neighborhood are filled, it is reasonable to conclude that an actual occlusion of the lumen is present. These findings are most commonly seen in asthma, but may be found in other chronic conditions. Many patients present themselves with clinical roentgenologic findings suggestive of bronchiectasis. When bronchography is done on these patients, frequently no dilatations of the bronchi are found. If these films are carefully examined, however, it will often be shown that actual occlusion of the bronchi is present and this may explain the patient's symptoms.

The importance of this finding in asthma is largely prognostic. Extensive obliteration of the bronchial lumina is of serious import in cases of bronchial asthma. In other types of cases the demonstration of occlusion of the smaller bronchi by roentgenography may be the only indication of the actual lesion which is present.

Discussion

DR. F. W. WITTICH: I would like to have Dr. Rigler tell us his experiences with the thinner iodized oil in determining just how much the bronchi are stenosed. Therapeutically, one seems to get better results by giving 15 or 20 c.c. lipiodine-Ciba, first filling up the smaller bronchi and then following with a like amount of the heavier oil, lipidol or iodochloral. If adrenal is given prior to the introduction of the oil and observed fluoroscopically, the oil will be seen to frequently descend farther into the small branches after apparently stopping rather abruptly in one of the larger branches, thus ruling out a permanent occlusion, from whatever cause besides spasm. With this method and a plate taken immediately which shows rather abrupt or rounded endings of the bronchi, the evidence, of course, would be much stronger for a permanent occlusion whether from mucous plugs, hypertrophy or cicatricial stenosis. Sacculations are not unusual in chronic respiratory allergy.

DR. DOUGLAS P. HEAD: Have you had any case that showed atelectasis?

DR. LEO G. RIGLER: In regard to lipiodine, I have tried to use a thin oil. The objection is that it enters the alveoli too readily and obscures the field so that it is difficult to see the bronchi. There is no doubt that some of the thin oil will get by in some of the small bronchi and reach the alveoli.

The question of atelectasis is a very interesting one. The atelectasis that we get in asthma is very different from the massive atelectasis we like to talk about. In asthma it is lobular and patchy. In addition to that, in the asthmatic there is a great deal of emphysema which neutralizes the effect of these atelectatic patches. Furthermore, as I said, the bronchi are not completely occluded as they must be in order to get much atelectasis.

LAWRENCE R. BOIES, M. D.
Secretary

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE Meeting of January 13, 1937

The Annual Meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, January 13th, 1937. The meeting was called to order at 8 o'clock by the President, Dr. E. M. Jones.

There were 53 members and 4 guests present.

Reading of the minutes and all other business was dispensed with and Dr. Jones turned the meeting over to the essayist of the evening.

Dr. THOMAS S. ROBERTS, Minneapolis, retiring President then said he would depart from the usual custom of addressing the Academy on some scientific subject and talk about his "hobby" instead. Dr. Roberts gave a most interesting and entertaining "Review of the Bird Life of Minnesota; illustrated with slides and colored movies."

The meeting adjourned.

A. G. Schulze, M. D., Secretary

NEWS ITEMS

The new director of the Hennepin County Tuberculosis Association is Dr. E. J. Lillehei, of Robbinsdale, Minn.

Dr. H. G. Irvine, of Minneapolis, is the new president of the Minneapolis Council of Boy Scouts of America.

Dr. W. C. Hills has moved from Newell to Sioux Falls.

Doctor John F. Briggs, of Saint Paul, Minnesota, has returned from a trip to Europe, and has resumed his practice.

Doctor Kenneth Sherman, formerly of Passavant Hospital in Chicago, Illinois, has resigned from that institution to enter practice at Sturgis, South Dakota.

Dr. A. W. Pasek, of Duluth, a graduate of the University of Minnesota Medical School, has announced that he will inaugurate practice at Lismore, Minn.

Doctor Harry William Arndt has opened his new office in the Nunn Building at Detroit Lakes, Minnesota. Doctor Arndt formerly practiced at Frazee.

Dr. M. J. Lindahl, formerly of Jasper, Minn., has moved his office to Pipestone, where he is located in the Pipestone National Bank Building.

Dr. J. P. Greaves, formerly of Sherwood, N. D., has inaugurated his own practice at Great Falls, Mont. For the past six years, Dr. Greaves has been associated with Dr. Coulter of that city.

The Richland County Medical Society of North Dakota unanimously adopted a resolution petitioning the county commissioners to discontinue the county doctor system and adopt a minimum fee-schedule for indigent cases.

Dr. Ted L. Havlicek has become associated with Dr. Ray E. Lemley, of Rapid City, South Dakota. Previous to this time Dr. Havlicek had been a member of the staff at Sanator, S. D.

Dr. Stanley J. Smith, of Chicago, recently joined the staff of the More Hospital at Eveleth, Minnesota. He is a graduate of the Northwestern University Medical School and for the past five years has been a member of the faculty of Loyola University.

Dr. R. D. Gardner, formerly of the More Hospital staff, Eveleth, Minnesota, and who has been associated with the Hopkins Clinic at Cleveland, Ohio, for the past number of years, was recently named head of that institution by the directors.

Arrangements are under way at Crookston, Minnesota, for a voluntary subscription fund with which to erect a memorial to the late Dr. O. E. Locken, medical leader and former mayor of that city.

F. O. Hanson, superintendent of the Swedish Hospital in Minneapolis, has been re-elected president of the Minneapolis Hospital Council. Others likewise returned to office are: Harry Brown, Northwestern Hospital, who is vice-president; Sister Anna Berglund, Deaconess Hospital, who is treasurer; and Rebecca Peterson, Saint Andrew's Hospital, who is secretary.

The new \$82,000 municipal hospital at Brookings, South Dakota, has just been completed. Modern in every detail, the hospital is one of the finest in the northwest. Miss Lavine Nelson is superintendent, and R. Magni Davidson is chief-of-staff.

Doctor Kenneth L. Bray, who was graduated from the University of Minnesota Medical School in 1934, is now associated with Doctors Hanson and Houston at Park Rapids, Minnesota.

Dr. Lars J. Hauge, for the past 32 years a physician of Howard, S. D., died at the age of 76 in Howard in November. Dr. Hauge was a graduate of the old Sioux City (Iowa) College of Medicine; but prior to that had been a minister in the Norwegian Lutheran Church.

Doctor Martin C. Berheim, of Hawley, Minnesota, was a member of the University of Minnesota's post-graduate medical institute during January. Doctor Berheim was graduated from the Medical School of the University in 1920.

Doctor Stanley S. Chunn, a graduate of the University of Minnesota Medical School in 1927, is now in practice at 123½ West Main Street in Pipestone, Minnesota.

Doctor John Arnold Malmstrom, health officer of Virginia, Minnesota, has resigned, and Doctor David Marcellus Parker, formerly a Civilian Conservation Corps physician, has been named as his successor.

Doctor Ramey M. Baker, 31, of Sturgis, South Dakota, died at St. John's Hospital in Rapid City on March 2, 1937. Doctor Baker was graduated from the University of Nebraska College of Medicine in 1931, coming to Sturgis in 1933.

Doctor Friede Van Dalsem, 92, pioneer physician of Beadle County, South Dakota, died in Huron during March. She is survived by four children and one sister.

Cascade County is one of the three counties in Montana maintaining a full-time city-county health department. The chief is Doctor Frank L. Watkins, who is also health officer for Great Falls, Montana.

A Charles Mix County health unit advisory committee has been formed by Doctor Pierre Romeo Pinard, of Wagner, South Dakota. This committee supersedes the old county board of health, and will be affiliated with both the state board of health and the United States Public Health Service of Washington, D. C.

Leila Ann Gorenflo, M. D., a graduate of Rush Medical College of the University of Chicago in the class of 1935, will commence practice at the Endion Hotel in Cass Lake, Minnesota. She has completed her internship at the Los Angeles County General Hospital in California.

Dr. L. H. Cady, of Minneapolis, succeeds Dr. Walter Ude as chairman of the staff of Saint Andrew's Hospital in Minneapolis. Dr. J. T. LaPierre is vice chairman, and Dr. Stanley Roberts is secretary.

Dr. Donald F. Fitzgerald, of Minneapolis, has been named chairman of the Saint Barnabas Hospital staff; Dr. Julius Johnson is vice chairman; Dr. H. D. Diessner is secretary-treasurer; and Dr. J. S. Reynolds is a member of the executive committee.

Dr. H. D. Nagel has established a hospital at Waconia, Minn. In addition to the rooms formerly used for his office, Dr. Nagel has taken more space and is operating a ten-bed hospital with a modern operating room and kitchen.

Dr. Leo R. Prins, a graduate of the University of Minnesota School of Medicine, and formerly of St. Paul, is now associated with the surgical and medical clinic at Albert Lea, Minn.

Dr. Ellis Giere, formerly of Rochester, Minn., has been named head of the Fort Peck Hospital at Fort Peck, Mont. Dr. Carl Eklund, of Minneapolis, will be assistant to Dr. Giere in his new position.

Dr. Kenneth F. Maxcy, head of the department of preventive medicine and public health at the University of Minnesota, was selected as one of the scientific directors of the International Health Division of the Rockefeller Foundation.

Dr. R. R. Hendrickson, superintendent and medical director of Fair Oaks Lodge Tuberculosis Sanatorium at Wadena, has resigned, effective May 1st, to enter private practice in that city.

Dr. James B. Carey was elected president of the staff at Eitel Hospital, Minneapolis, at the annual banquet held at Hotel Radisson. Dr. William B. Roberts was named vice president, and Dr. Frank R. Hirshfield, secretary.

A new Indian hospital with a nurses' home, a doctors' residence and a six-car garage, has just been completed at Sisseton, S. D., at a cost of \$185,000. Miss Ferne Rumsey is superintendent of nurses.

Doctor Henry E. Sigerist, professor of the history of medicine at Johns Hopkins University in Baltimore, Maryland, went on record as favoring health insurance at Rochester, Minnesota, on March 1, 1937. Professor Sigerist, a graduate of the University of Zurich Faculty of Medicine in 1917, said: "I know the profession opposes health insurance; but I think it is unavoidable, and that it will come. It is impossible to avoid it."

Fifty hospital superintendents and assistants from various Minnesota cities gathered at the University of Minnesota on March 18 for the first hospital administration short course ever offered. The course lasted 3 days, and was sponsored by the Minnesota Hospital Association and the University of Minnesota Center for Continuation Study. Doctor Bert Wilmer Caldwell, executive secretary of the American Hospital Association, attended.

Doctor E. C. Smith, 77, passed away on January 9, 1937, at Winner, South Dakota. Doctor Smith, a pioneer physician of South Dakota, was president of the Rosebud District Medical Society, and health officer for Todd County, at the time of his death. He was a member of the South Dakota State Medical Association and of the Sioux Valley Medical Association. He was in practice at Mission, South Dakota.

The regular semi-annual mid-winter meeting of the Montana Academy of Oto-ophthalmology was held in Butte, February 21 and 22, under the presidency of Dr. Edward S. Murphy of Missoula. The mid-summer meeting will be held concurrently with the Pacific Northwest Medical Society in Great Falls in July. Dr. Arthur L. Weisgerber of Great Falls was elected president, and Dr. A. W. Morse was reelected secretary-treasurer.

Among the Montana eye and ear surgeons who attended the Los Angeles Research Study Club post-graduate course the last two weeks of January were Drs. William J. Marshall, of Missoula, W. R. Morrison of Billings, and L. G. Dunlap, Anaconda.

On February 13, 1937, the eleven Montana fellows of the American College of Physicians met in Great Falls for the purpose of discussing the advisability of a closer organization which would further the cause of scientific internal medicine. It was decided that the organization should be known as the Montana Society of Internists and that its membership should be limited to fellows of the American College of Physicians. The governor for Montana, Dr. L. H. Fligman, was continued in the office of chairman of the proposed society. Dr. H. C. Watts was elected to serve as secretary. It is planned to hold a meeting at least once yearly at which time a program of general scientific interest will be arranged. The date has not yet been set but it will be so fixed as not to interfere with the annual meeting of the American College of Physicians.

J. F. D. Cook, M. D., secretary of the Third District Medical Society of South Dakota reports that the March meeting was held at Brookings in the Dudley Hotel. Doctor Eivind Klaveness, of St. Paul, Minnesota, spoke on "Grenz Rays: Their Origin and Therapeutic Use." The April meeting of the society will meet on April 1, in Madison, with Doctor J. C. Ohlmacher, dean of the University of South Dakota Medical School, speaking on "Pathology and Laboratory Tests: Their Significance" and "The Treatment of Kidney Conditions."

A special program of lectures and demonstrations in surgery and medicine will be held under the direction of the Mayo Foundation at Rochester, Minn., from April 5 to 9, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings, in addition to clinico-pathologic conferences, symposiums will be conducted on urology, cardiology, gastro-enterology, dermatology, endocrinology, diseases of the colon and rectum, orthopedics and arthritis. Visiting physicians will be welcome guests.

Captain A. H. Robnett, M. D., of the U. S. Navy, Great Lakes, Illinois, announces that examinations will begin on May 10 for graduates of Class "A" medical schools who wish to become assistant surgeons in the U. S. Navy. Accepted graduates will be given a post-graduate medical course at the Navy Medical School in Washington, D. C. Physicians interested should address: Bureau of Medicine & Surgery, U. S. Navy Department, Washington, D. C.

Benjamin Hobson Frayser, M. D., 50, chief of the surgical staff of the Fort Harrison, Montana, Veterans' Administration Facility, until 1931, died at Lexington, Kentucky, on March 5, 1937. Doctor Frayser was graduated from the medical department of the Lincoln Memorial University in Knoxville, Tennessee, in 1909.

Doctor Elmer G. Balsam, secretary of the Medical Association of Montana, has announced the following committee chairmen for the state medical convention at Great Falls on July 12, 13, and 14, 1937: General chairman: Doctor Martin Larson of Great Falls; general vice-chairman: Doctor Faus Peter Silvernale, of Great Falls; general secretary: Doctor Laurence Laurie Howard, of Great Falls. Doctor Charles J. Bresee, Great Falls, is in charge of publicity; Doctor Fred Lee Anderson, Great Falls, heads the hotels and transportation group; Doctor Silvernale will conduct registration; Doctor Ernest Dexter Hitchcock, Great Falls, will serve as entertainment chairman; and Doctor Larson will arrange the program. The meeting of the Montana body will be followed by a three-day meeting of the Pacific Northwest Medical Society.

The South Dakota State Board of Health receives numerous requests from Todd and Campbell Counties asking that a doctor locate in these communities. Todd County has been without the services of a physician since the death of Dr. Smith several months ago. The population is 6,463 with approximately half of this number Indian. Campbell County has a population of

5,634 and has been without a doctor for five months. Should the proposed medical relief program become operative, these counties would be excellent locations for progressive doctors.

Dr. E. R. Crow, of Arlington, reports that the Scott-Carver County Medical Society held a meeting at Mud-baden Sanitarium, January 11th, in conjunction with the Minnesota Valley Dental Study Club. The meeting was devoted to a discussion of economics and legislative matters of interest to both groups. Speakers for the medical society were Dr. L. L. Sogge of Windom, and Mr. Manley Brist of St. Paul. Introduced by Dr. D. W. Wilson, of Belle Plaine, were guest speakers of the dental society: Drs. Clayton Swanson and Louis Weiss, of Minneapolis.

BOOK NOTICES

KINESIOLOGIC EXERCISES

The Kinesiology of Corrective Exercises, by GERTRUDE HAWLEY, M.A.; 1st edition, cloth, 268 pages, 107 engravings, bibliography; Philadelphia: Lea & Febiger, Inc.: 1937. Price, \$2.75.

The stated purpose of the book is to provide a practical text in kinesiology for the use of students, teachers, and physiotherapists specializing in the field of corrective exercise.

Part one, consisting of eight chapters, is devoted to a review of anatomy and pathology of the bones and joints, and is well-documented with bibliographies. Part two has nine chapters devoted to corrective exercises and positions. There is no bibliography for part two, which is technical material describing in detail exercises used by the writer in the practice of physiotherapy.

Descriptions of specific exercises are careful and thorough, often illustrated with clear outline drawings to constitute a comprehensive treatment of the subject.

The book is very readable and constitutes a valuable addition to the literature on technique of corrective exercise. It is recommended for teachers of physical education, for students working toward teaching credentials in this field, for administrators of secondary schools and colleges, and for others interested in physiotherapy.

The author is assistant director of the women's gymnasium of Leland Stanford University in Palo Alto, California.

HELEN B. PRYOR, M.D., *Director*,
Physical Education for Women,
Leland Stanford University,
Palo Alto, California.

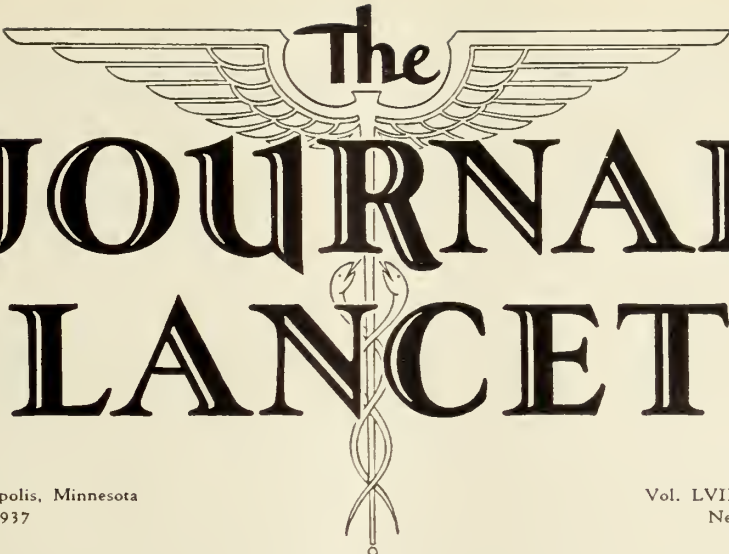
GUEDEL ON ANESTHESIA

Inhalation Anesthesia, by ARTHUR E. GUEDEL, M.D., with a foreword by RALPH M. WATERS, M.D.; 1st edition, cloth, 182 pages, index, illustrated; New York: The Macmillan Company: 1936. Price, \$2.50.

This thoughtful book is just off the press. The dedication is touching and most appropriate. The brief preface is full of real meaning. The foreword by WATERS is a stellar tribute to what the author has done for the teaching of anesthesia. The material in the book itself is excellent. It reads smoothly, concisely, and with authority. There can be no better presentation of the mechanism of inhalation anesthesia than has been accomplished in the 12 pages of the first chapter. The diagrams very clearly show the stages and signs of anesthesia, and help greatly in understanding the picture. The second part on "Anesthetic Accidents" is superb. The author is associate clinical professor of surgery in the University of Southern California Medical School.

JOHN W. SHUMAN, M.D.,
Associate Professor of Medicine,
College of Medical Evangelists,
Los Angeles, California.

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New Series

Clinical Changes Produced by Diarrhea And Their Restitution*

Lee Forrest Hill, M. D.

Des Moines, Iowa

ALTHOUGH the mortality rate from the diarrheal diseases has undergone a remarkable decline in the last quarter of a century, still the problem of saving life from these causes continues to be of frequent occurrence in the practices of the general practitioner and the pediatrician. In recent years considerable information has been added to our knowledge of the changes produced in the body by diarrhea, and methods have been developed for correcting these changes, which, when effectively carried out, have been demonstrated capable of reducing the mortality in the severest types of cases from around seventy per cent to as low as twenty or thirty per cent.

The etiologic factors concerned in the production of diarrhea are far from being on a clear-cut and readily classifiable basis. No attempt will be made here to enter into a detailed discussion of this phase of the subject, since regardless of the cause, the resulting changes and the treatment demanded, are essentially the same. It is possible, however, to divide the diarrheal diseases into two rather distinct groups; the one has a specific bacterial etiology in which the intestinal wall itself is invaded and blood and pus characteristically appear in the stools, and to which the terms infectious diarrhea, or dysentery, or acute colitis are commonly applied; the other constitutes the remaining types of diarrhea in which the contents of the intestinal tract are involved and in which a multiplicity of etiologic factors are concerned. As Marriott¹ has pointed out, diarrhea should not be looked upon as a disease entity in itself, but as a symptom resulting from a variety of causes.

In private practice, parenteral and enteral infections undoubtedly account for a majority of the diarrheas encountered. In the late summer and fall months there usually occur, in this part of the country at least, mild epidemics of gastro-enteritis characterized by an acute pharyngitis, vomiting, fever and diarrhea of varying intensity. Healthy breast-fed and bottle infants as well as older children are likely to be attacked if exposure occurs. Occasionally, a severe case is encountered in which there are vomiting, convulsions, and such a marked fluid-loss that serious changes, to be described later, result. Climatic conditions are undoubtedly responsible in some way for the prevalence of bacterial life during this season, which either directly or indirectly by toxic action, has a predilection for the intestinal tract; whereas in the winter months the prevailing type of bacterial activity is largely confined to the respiratory tract. While excessive heat and humidity may be capable of depressing the digestive function to the point of initiating a diarrhea here and there, nevertheless the rôle played by these factors is decidedly subordinate to infection as a cause of the so-called "summer diarrheas." Numerous investigators have conducted bacteriologic studies of stools in attempts to isolate the offending organisms, but the varieties of bacteria responsible have been almost as numerous as the investigators themselves, so that no justifiable conclusion on this point can be made at present. It should be understood that such a statement does not apply to bacillary dysentery where the specific bacterial etiology has been established for many years. It may, however, be difficult to differentiate bacillary dysentery from epidemic enteritis at the onset, before the characteristic stools of the former have made their appearance.

*Prepared expressly for the special Pediatric issue of THE JOURNAL-LANCET.

Aside from this group of diarrheas occurring epidemically in the autumn months, parenteral infections, particularly of the nose, throat, and ears, are frequently the underlying factor in gastro-intestinal disturbances occurring at any season of the year. Recently a month-old baby came under observation because of a suddenly-developed diarrhea. The crying and fretfulness could easily have been attributed to colic, since the temperature was normal; but one ear drum was found to be bulging, and upon incision, pus was obtained. Jeans and Floyd² and Marriott³ have drawn attention to a special type of parenteral infection in which symptoms resembling cholera infantum have been shown to be secondary to an otitis media or mastoiditis or both. Such a syndrome is largely confined to undernourished institutional infants, and is seldom seen in private practice.

Other parenteral infections may also precipitate a complicating diarrhea; but in general there is less likelihood of this development occurring when the infection is located in some other part of the body than the rhinopharyngeal and otitic region; for instance, in the kidney or lung.

Important as are enteral and parenteral infections in the production of diarrhea, the impression must not be given that all diarrheas arise from these causes. Over-feeding or unsuitable milk mixtures may cause intestinal indigestion in infants, and underfeeding may result in diarrheal type of stools. Prematurely or newly-born infants who of necessity are deprived of breast milk, and constitutionally weak infants as well as infants suffering from malnutrition, comprise a group in whom the digestive capacity is limited. Spoiled food is less a factor in recent years than formerly, since most parents even in the poorest of circumstances have learned the importance of boiling milk and of keeping it in suitable condition. The widespread popularity of evaporated milk has also accomplished much in this direction. Mechanically indigestible foods, gastro-intestinal allergy and gastro-enterospasm are further causes which occasionally are responsible for intestinal indigestion.

In all cases of diarrhea it is desirable to determine the underlying cause, since this may have an important bearing upon the subsequent management of the case. From what has been said it is obvious that a most careful physical examination, including examination of the ears with an electric otoscope, is essential if parenteral infections are to be located and properly treated.

The *modus operandi* by which diarrhea is brought about from the various causes enumerated above has long been a baffling problem, and indeed has not been entirely settled up to the present time. All the food elements at one time or another have been blamed. Finkelstein thought fermentation of carbohydrates was at fault, and devised protein milk (one of the most valuable contributions ever made to infant feeding), to counteract its effects. In recent years Marriott and his co-workers at St. Louis have advanced the theory that many of the diarrheas of infancy are the result of the growth of organisms in the upper intestinal tract which are normally present only in the lower bowel. A decrease

in gastric acidity favors the migration of colon bacilli to the upper intestine. Gastric acidity has been shown to be decreased in infection, and in weak undernourished infants. Cow's milk with its higher buffer capacity neutralizes the acid of the gastric juice, which may be one reason why artificially-fed infants have a greater tendency to diarrhea than breast-fed infants.

The harmful effects of colon bacilli growing in the small intestine and stomach may be produced by the elaboration of toxic material such as histamine, or an actual invasion of the body by the bacilli may occur. Casparis⁴ has suggested that guanidine formed in the course of severe diarrheas and circulating in the blood stream may be partially responsible for the toxic symptoms, and recommends administration of calcium to counteract its harmful effects. Nedzel⁵ advances the interesting theory that the cause of summer diarrhea (excluding the cases definitely connected with pathogenic organisms) is due to a disturbed balance of the autonomic nervous system occasioned by extreme heat. Thus it is apparent that the underlying factors responsible for the initiation of the non-specific type of diarrheas are many, and that the manner in which these factors operate to bring about the diarrheas is in many instances only theoretically explainable. The results of diarrhea, however, are fortunately fairly well understood.

Clinical changes result from diarrhea only when the diarrhea is of a severe type. Mild types of diarrhea produce little or no evidence of illness beyond fretfulness. Fever and vomiting may be present, but interest in surroundings is maintained and color and tissue turgor are undisturbed. However, transition from the mild to the severe type frequently occurs with startling rapidity. In a few hours the patient may become apathetic and grayish, with sunken eyes, rapid pulse, and poor tissue turgor. Convulsions may occur, fever becomes high, and the lips assume a cherry-red hue, while the respiration becomes deep and pauseless. Continuation of the symptoms results in coma and death. It should be emphasized here that the mild type of diarrhea should not be taken too lightly as something of little significance which a dose of castor oil will relieve. A day or two of correctly prescribed simple therapy at the onset of the disturbance may prevent the necessity of weeks of complicated and drastic measures later on in neglected or badly managed cases. The time-honored custom of administering a physic whenever the bowels become loose should be mentioned only to be condemned. The intestine is already irritated, and what is to be gained by further irritation? More water is removed from the body at a time when the paramount objective should be to maintain the supply. Withholding food for twelve to twenty-four hours and giving water and weak tea solution in as large quantities as will be accepted is the logical method of treatment of a diarrhea at its onset. When food is begun it should be weakened sufficiently to be tolerated by the disturbed digestive function, and additions should be made gradually and under careful observation for evidences of return of the symptoms of indigestion. Protein milk is usually a very satisfactory type of food to

start after the initial period of starvation. It should not be used longer than forty-eight hours without the addition of carbohydrate, because of the risk of establishing a proteolytic indigestion which is characterized by very foul-smelling brownish liquid stools. Many infants who have a diarrhea tendency on correctly constructed milk formulae can be fed successfully on protein milk with added carbohydrate for considerable periods of time.

The symptoms produced by a severe type of diarrhea are usually described under the terms of "alimentary intoxication," or "intestinal toxemia." Marriott, Hartmann, and Senn⁶ state that these symptoms "are the secondary results of disturbance in the chemical equilibrium of the body brought about as the result of loss of water, salts and organic material by way of the gastro-intestinal tract and that the development of the clinical picture of intoxication depends more upon the degree and severity of the diarrhea than upon the nature of the underlying cause. Any severe diarrhea, whether occurring as the result of enteral or parenteral infection, or other causes, may be associated with the development of symptoms of intoxication."

For purposes of discussion, the clinical changes entering into the picture of alimentary intoxication may be further sub-divided into athrepsia, anhydremia and dehydration, acidosis, and toxicosis. Such changes may be present in various combinations in the individual patient, depending upon the severity and duration of the diarrhea; or in very severe prolonged cases all the changes may be present.

Athrepsia, or starvation, results from failure to assimilate sufficient food to provide for the fuel needs of the body. Underfeeding, vomiting, and diarrhea are the contributing factors. Under such conditions the body tissues are consumed to provide fuel, and in prolonged cases this process continues until the familiar picture of "the little old man" is presented. Marriott¹ estimates that as much as 25 to 50 per cent of the fat, 50 per cent of the ingested carbohydrate, and 15 per cent of the protein may fail of absorption in the presence of diarrhea.

Whenever loss of water from diarrheal stools exceeds in amount the utilizable intake, dehydration or desiccation of the body begins. Inter cellular fluid provides a reservoir which tends to maintain a normal blood volume as long as possible, but with continued loss of water this supply becomes exhausted and anhydremia or concentration of the blood occurs. The decrease in the fluidity of the blood impairs the circulation, and lessens the urinary output, factors which contribute to the upsetting of the normal acid-base balance, as will be discussed later. From the clinical viewpoint, it is important that the symptoms of dehydration be recognized as early as possible. It is the onset of this condition which causes the patient to change from an attitude of lively interest to one of apathy. He no longer desires to be up and about, or if an infant, he ceases his usual active motions. The color becomes grayish, the tongue and mucous membrane are dry, and the skin lacks its usual resiliency. The eyes have a sunken appearance, and the pulse rate is fast.

Urination is scanty. Loss in weight in an infant may be as much as a pound in twenty-four hours. Such a picture does not demand the giving of purges, enemas, and drugs, but the giving of water immediately and in sufficient amount to restore the blood volume and intercellular fluid to the normal content. Furthermore, water administration must be continued by whatever route necessary to equalize the loss and maintain the supply in the body. Prompt recognition of the symptoms of dehydration at their onset may make it possible to restore body fluids by relatively simple means, such as hypodermoclysis of 500 to 1,000 cubic centimeters of sterile physiologic salt solution, thus preventing the further development of more serious changes in the body not so easily correctable.

Clinically, acidosis is recognized by the type of breathing. The deep, pauseless, "air hunger" type of respiration is an expression of the effort being made by the body to rid itself of excess acid. Several factors combine to bring about acidosis in severe cases of diarrhea and anhydremia. In the first place an actual loss of minerals occurs in the diarrheal stools, and since base ions predominate over acid ions in the intestinal secretions, the ultimate effect of diarrhea is a reduction in the bicarbonate content of the blood plasma. Normally the urine serves as one of the efficient mechanisms for acid-base regulation, by excreting excess acids neutralized by ammonium salts. However, as has been noted, in anhydremia the urine output is greatly reduced, so that this mechanism becomes ineffective and acids remain in the body to reduce further the bicarbonate. Lactic acid collects in the tissues because of the impaired circulation and anoxemia, and ketone acids may be formed as a result of incomplete combustion of the fats secondary to the partial starvation going on in severe diarrhea. These are the more important factors which combine to deplete the alkali reserve of the body, sometimes to such an extent that chemical analysis shows the bicarbonate to be less than one-fifth of its normal amount.

Patients with severe diarrhea may manifest only signs of anhydremia and acidosis; but frequently toxic symptoms are also present. These are chiefly fever and convulsions. Occasionally one sees a fulminating case of diarrhea in which the toxemia is so great that death results in a few hours from the toxemia. One such case came under observation only recently. A two-year-old child became ill in the evening with fever, enteritis, and convulsions. Death occurred the following morning in spite of vigorous therapy. Autopsy showed only congestion and inflammation of the entire intestinal tract.

The therapeutic indications for restitution of the clinical changes brought about by severe diarrhea are clear-cut, and must be adequately met if the lives of these patients are to be saved. The acidosis and anhydremia of diarrhea presents an emergency no less great than the emergency of acidotic coma in diabetes. Fluid-loss must be replaced, and the supply maintained day after day so that blood volume and intercellular fluid may be restored and kept at normal levels. Loss in weight must not be permitted to occur. Minerals must be supplied in

adequate amounts to replace those lost in the intestinal secretions, and a normal balance must be maintained. The diarrhea must be brought under control as rapidly as possible and nutritional needs must be met as soon as digestive function permits.

Fluids may be administered by mouth, subcutaneously, intraperitoneally, intravenously and by venoclysis. In severe diarrhea, it may be necessary to employ all these routes. The amount of fluid lost from the body in some diarrheas is frankly amazing. Several cases may be cited to illustrate this point. A three weeks-old infant was brought into the hospital one evening weighing five pounds and fourteen ounces. During the night 500 cubic centimeters of fluid were given subcutaneously and six ounces were consumed by mouth. The next morning the weight was five pounds and ten ounces, a net loss of four ounces. A premature infant weighing four pounds developed a diarrhea with as many as twenty-two stools in twenty-four hours. In the twenty-four hour interval, a total of 1081 cubic centimeters were given subcutaneously and by mouth, with a net loss in weight of three and one-half ounces. A five year-old child entered the hospital with a severe enteritis, with marked anhydremia and acidosis. The total quantity of fluid administered in the subsequent eight days was 2150 cubic centimeters intravenously, 7,900 cubic centimeters subcutaneously, and 140 ounces by mouth. Only by the administration of these large volumes of fluid could the symptoms of dehydration be overcome.

Venoclysis must be considered the most efficient of the routes for parenteral administration of fluid; but the technical difficulties attendant upon this method make it of limited value, particularly in infants. For those who are interested, a technic of this procedure has been described by Spinek in the issue of the *Journal of Pediatrics*, and Karelitz in the March 1937 issue of the same journal.

The peritoneal cavity provides an easily accessible and efficient route for the administration of fluids, and with reasonable regard for asepsis, this method may be carried out in the home. The needle is inserted in the mid-line or slightly to the left about an inch below the navel, and pushed through the abdominal wall in an oblique manner upwardly, in order to avoid any chance of puncturing the bladder. The contra-indications are distention and adhesive peritonitis. From 150 to 400 cubic centimeters, depending upon the age and size of the patient, may be given once or twice daily. Glucose solution should not be given intraperitoneally because it produces a sterile peritonitis.

Intravenous administration of fluids provides the quickest and most efficient route for restoring fluids and minerals. In infants and young children it is usually necessary to cut down on one of the veins in the antecubital fossa or in the ankle just anterior to the internal malleolus. The longitudinal sinus should be used only when other sites fail, or when one has had a great deal of experience in using this route.

No comments concerning the subcutaneous administration of fluid are necessary other than to warn against

the use of glucose in stronger dilutions than five per cent, since irritation of tissues and sloughs are occasionally encountered by higher concentrations. When needles are placed bilaterally in the thighs and axillary regions, and fluid is allowed to run in slowly, surprisingly large quantities can be given in the course of a few hours with very little discomfort. Frequently it is our custom to give as much as 1,00 cubic centimeters to an infant during the night without disturbing sleep.

Hartmann⁷ has described very clearly the various types of fluids which are necessary to restore the changes brought about by severe diarrhea. Practically, only four solutions need be considered. These are physiologic salt solution, glucose solution, Hartmann's solution and blood.

Physiologic salt solution is the least effective of any of these solutions. In our own experience, it is seldom used, being replaced by glucose and Hartmann's solutions. In mild degrees of dehydration, it may suffice to restore blood volume and tissue fluids, and by re-establishing urinary flow permit acid elimination through the normal kidney mechanism. However, in severe dehydration and acidosis its use is contra-indicated, because chloride ions are already in excess in the blood plasma, and the injections of more chloride directly into the blood stream may increase the already existing acidosis.

In severe dehydration glucose, given intravenously, is indicated. It may be given in a ten or twenty per cent solution, and in a dosage of twenty cubic centimeters per kilogram of body weight. Two or more injections daily may be necessary. In addition to replacing lost fluid, glucose acts as a diuretic, overcomes ketosis, and furnishes a certain amount of food, which may be of value if atrepsia is present to any degree.

The combined use of ten per cent glucose and Hartmann's solution, administered intravenously or by venoclysis, is the measure of choice in correcting anhydremia and acidosis. Hartmann's solution is available in the market under the name of physiological buffer salts solution, or as lactate, Ringer's solution. The solution is a mixture of neutral sodium lactate and the chlorides of sodium, calcium, and potassium. It is effective in either acidosis or alkalosis, even where previous chemical determinations of the blood have not been done. The conversion of sodium lactate into bicarbonate proceeds at a rate sufficiently slow to prevent the danger of shifting from acidosis to alkalosis, such as sometimes occurs when sodium bicarbonate is the solution injected. By means of this solution, then, minerals lost in the intestinal secretions can be replaced and the soda bicarbonate is restored to normal levels. It may be given intraperitoneally and subcutaneously, as well as intravenously and by venoclysis. In a severe diarrhea exhibiting symptoms of dehydration and acidosis, the procedure would be to give twenty cubic centimeters per kilogram of Hartmann's solution in ten per cent glucose intravenously, and either repeat this amount one or more times daily in single injections, or by the continuous drip method, run in three to six drops per minute. From 150 to 400 cubic centimeters of Hartmann's solution would be

given intraperitoneally and from 500 to 1,000 cubic centimeters subcutaneously, these amounts to be replenished as rapidly as absorption occurs.

Molar's sodium lactate in isotonic solution is somewhat more effective in correcting a severe acidosis, but ordinarily it is not necessary to use both types of solutions.

The value of one or more blood transfusions in these seriously ill patients to supplement the fluid and mineral administration should not be overlooked. Particularly is this desirable when athrepsia and anemia have resulted from a prolonged diarrhea. Blood transfusions should not be given until the dehydration has been overcome.

Drugs find little place in the management of the diarrheas. Paregoric in suitable dosage may be used for relief of tenseness, and adrenalin or caffeine may be necessary as stimulants in collapse.

Feeding is a problem which merits some attention. In acute diarrhea, if of any severity, all food should be stopped for a period of twelve to twenty-four hours. Parents readily grasp the point if it is suggested that the way to put out a fire is to withhold fuel and put on water. After the period of starvation, protein milk is begun in quantities and dilution suitable to the age and condition of the infant. Powdered protein milk is available on the market, and when four level packed tablespoons are dissolved in twelve ounces of water the proportions of Finkelstein's original Eiweissmilch are obtained; i. e., fat, 2.2 per cent, carbohydrate, 2.0 per cent, and protein, 3.3 per cent. Such a food is not readily attacked by the fermenting type of bacteria, and yields about twelve calories to the ounce. Carbohydrate in the form of corn syrup or dextri-maltose should be added after forty-eight hours of protein milk feeding. When improvement in the diarrhea occurs a gradual shift to some form of acidified milk should be made, either skimmed lactic acid milk, acidified evaporated milk, or buttermilk. No attempt can be made to meet caloric requirements in the early stages of the diarrhea; rather the concentration of the food must be adjusted to meet digestive tolerance.

No discussion of the dietary management of diarrhea would be complete without reference to the raw apple diet. This method of treatment was first used in Germany some twenty years ago. It has had extensive trial in this country and most of the reports are favorable. It has been satisfactory in our experience. Essentially the method consists of giving from one to four tablespoons of graded ripe raw apple (including the skin) every two hours day and night for forty-eight hours. Nothing else is given by mouth except water or weak tea solution.

Parenteral fluid administration is given as indicated to prevent or overcome dehydration. The exact substance in the apple which is responsible for the beneficial results has not been definitely determined, but the measure is worth a trial in suitable cases.

Summary

1. Diarrhea still occurs with sufficient frequency and seriousness to be one of the major problems among the illnesses of infants and children.

2. Except for bacillary dysentery, diarrhea is a functional rather than an anatomic disturbance and is the result of various etiologic factors.

3. Determination of the cause of the diarrhea is important so that treatment of the underlying factors, such as a parenteral infection (otitis media), may not be overlooked.

4. Mild diarrhea produced no significant clinical changes.

5. Appropriate treatment of mild diarrhea may prevent the sudden development of severe symptoms.

6. Purging is not only of no value in the treatment of diarrhea, but may be harmful.

7. Severe diarrhea results in clinical changes described by the terms, dehydration, anhydremia, acidosis, toxemia, and if prolonged, athrepsia.

8. Restitution of such changes requires the replacement and maintenance of the fluid and mineral balance of the blood plasma and tissues of the body.

9. The quantity of fluid necessary to prevent dehydration may be very large, and may require parenteral administration by all routes.

10. Protein milk, acidified milk, and raw apple are suggested as measures to be used in dietary management.

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Observations on Pneumonia in Childhood*

Edward Dyer Anderson, M.D.**

Minneapolis, Minnesota

IN THIS paper I wish to discuss some of the aspects of pneumonia that have seemed particularly interesting to me, some of the mistakes that I have made and the lessons they have taught me, with some conclusions that I have arrived at in my practice.

First, as to some of the unusual diagnostic problems which we meet in pneumonia in childhood.

When in medical school, I thought that it was always easy to make a definite diagnosis of either broncho or lobar pneumonia. I believed that there would never be any question as to with which type of pneumonia one was dealing. I expected always to have the involvement of a whole lobe with massive physical findings in lobar pneumonia, and numerous scattered small areas in bronchopneumonia. Also, if I were dealing with lobar pneumonia, I expected to have a typical maintained-temperature curve, while in bronchopneumonia I would have an absolutely different type; namely, an irregular curve. Although in the majority of cases one can make a definite diagnosis as to which type of pneumonia one is dealing with, nevertheless, this is not always true. The temperature curves do not always go as expected. Also, in bronchopneumonia you rarely have small scattered areas, but more often, have one area which may be large or small. I have seen more than one case in which I never was able to state definitely which type of pneumonia was present.

It has been often said that as we become older we become more tolerant of our fellow men. I believe this is particularly true of physicians regarding their fellow practitioners. As we grow older we learn how fallible we are, and that the mistakes which we used to think of with such scorn when made by other physicians, can be so easily made by ourselves. When first starting the practice of medicine, I remember how I used to raise my eyebrows when I learned of some case where a doctor had made a diagnosis of pneumonia and the next day the child was well, with temperature normal, respirations normal and the child "raring" to get up. Well, I don't raise my eyebrows any more, because more than once I have seen a child with temperature of 103-105, respirations of 40-60, cough, grunting respirations and physical findings in the chest showing fine sub-crepitant râles, and have told the parents that the child was very sick with pneumonia and that it probably would be seriously ill for several days, and then on coming to see the child the next day, have found the parents sitting on him trying to keep him in bed, and all symptoms and physical findings gone. Whether these cases are pneu-

monia of very short duration, or are due to asthma occurring during an acute upper respiratory infection, or whether they are cases of capillary bronchitis, one often cannot say. I do know they occur, and they have fooled me more than once.

Then there is the case of lobar pneumonia which we so frequently see where no physical signs appear until the third, fourth, or fifth day. In fact, there are many cases where physical findings never appear, and the X-ray alone confirms our clinical diagnosis. We should not necessarily feel that we are poor diagnosticians when we fail to hear signs in the chest in the first few days of an illness in which the clinical and X-ray findings are unmistakably those of pneumonia. In such a case, the involvement may be so located in the chest that the findings are not transmitted to the surface where we can hear them.

Another condition which has always been of interest to me is that type of pneumonia in which the child does not seem to be particularly sick. This type is usually a bronchopneumonia and is most frequently seen in the late spring or summer. The child runs a very low-grade temperature, has little or no toxicity and is with difficulty kept in bed. Even though these children are really only slightly ill, there may be physical and X-ray findings showing involvement of a considerable area of lung tissue.

The frequency with which lobar pneumonia in children may give the clinical picture of appendicitis has been noted many times. I wish only to emphasize again its frequency and to call attention to the extreme care that one must take in ruling out pneumonia in every case of appendicitis in children before performing an appendectomy.

Another condition which we occasionally meet in lobar pneumonia in children which requires diagnostic care is the case which simulates meningitis. Not infrequently, we see a child with all the clinical findings and symptoms of meningitis, who has only a meningismus along with his pneumonia. In this case, X-ray and spinal puncture will rule out meningitis.

Otitis media, abdominal distention and empyema are frequent complications of pneumonia in children. The first, otitis media, is extremely common, particularly in the lobar type. It often occurs without causing pain to the child. Certainly one should examine daily the ear drums of every child ill with pneumonia. In a large percentage of cases, the otitis media clears up spontaneously without rupture of the drum or paracentesis. I personally never open the drum unless there is severe pain or mastoid tenderness, or unless there is definite bulging. Even in these cases when rupture of the drum has taken place or paracentesis is done, the

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**Instructor in Pediatrics, University of Minnesota Medical School.

drainage usually stops soon after the pneumonia clears up.

Abdominal distention is a common and most troublesome complication. When severe and prolonged, it is usually a bad prognostic sign. Nasal suction has proved to be a most valuable method of treating this complication, and is usually far superior to the old methods of hot stupes and repeated enemas.

Empyema is one of the most dreaded complications that we meet. The best method of treating this condition is still under dispute. As is well known, long before the work done by the empyema commission during the war, Dr. Holt called attention to the high mortality in children in whom open drainage was done during the acute pneumonia. He advocated that conservative treatment be used until the acute stage of the pneumonia was well passed. After the war, the accepted method of treatment of empyema in both adults and children was to use either aspiration or the closed method of drainage. Several years ago, some authors advocated the use of repeated aspirations alone, and felt that the majority of cases in children could be cured without the use of closed drainage or rib resection. I do not believe that these authors at the present time are as enthusiastic about the use of this procedure as the sole method of treatment as they formerly were. It is a method of extreme value during the acute stage of pneumonia, and in some cases of empyema one is able to use it alone with complete cure. However, in the majority of cases more radical procedures are necessary to cure the empyema completely.

For several years closed drainage was considered to be the method of choice in the treatment of those cases of empyema in children where aspiration alone was not sufficient. In my experience the closed method of drainage has proven most unsatisfactory in the majority of cases, and in most instances has been a flat failure. It is almost impossible to get a really air-tight system in children for any length of time. They are so active, wriggle, twist and squirm so much, that in a short time there is leakage around the tube. Also, the fluid usually becomes so thick that it will not drain adequately through a catheter or tube.

The method of closed drainage is unquestionably of value in those cases in which inadequate drainage is obtained by aspiration, but where the child is too ill to attempt rib resection. In some instances the closed method will serve to cure completely the empyema. However, in my experience this is usually not the case, and after the child has gained sufficient strength, rib resection has to be resorted to.

The method of procedure which I most commonly use today is as follows: if empyema develops, I use aspiration during the acute pneumonia, repeating this procedure as often as is found necessary to reduce pressure symptoms. Aspiration is continued until the acute stage of pneumonia is passed, or until I am convinced that the empyema is cured or that the fluid is going to continue to form or until the fluid becomes so thick that

it can no longer adequately be aspirated through a needle. Within at least a week or ten days from the time one considers the acute pneumonia to be over, one can determine whether the empyema is subsiding. When this decision is made and aspiration is not adequate, if the child is in good general condition, a rib resection is done. If the child is not in condition to stand rib resection, a large catheter is introduced into the chest cavity by the trochar method. Effort is made to avoid leakage around the catheter, and also to prevent too-rapid drainage of the fluid at first; so as to avoid too rapid change of pressure in the chest with resultant circulatory difficulties. For the first 24 or 48 hours, the catheter is connected up with a negative pressure apparatus, for perhaps, for this length of time there may be little or no leakage around the wound. Usually at the end of this time the negative pressure apparatus is disconnected and sterile dressings placed over the catheter. Suction with a syringe or washing with Dakin's solution or normal salt solution to prevent clogging of the tube is sometimes of value.

In some instances the empyema clears up. However, in the majority of cases it does not, as adequate drainage cannot be obtained in this way. Nevertheless, the child has usually gained in general strength, and when one sees that adequate drainage is not being obtained, rib resection is done.

There is often a tendency for all of us to forget the value of rest in the treatment of pneumonia. I think we all agree that this is the most dreaded thing to be obtained in the treatment of this disease. Certainly I have become convinced that this is more important than anything I can do for a child ill with pneumonia. Yet I realize that I myself, have at times in the past, been instrumental in keeping the child from getting the thing it needed most. In my zeal to do something to help, I have ordered procedures, medications, food and fluids to an extent that has made it impossible for the child to get adequate rest. There was a time when I thought that if a child with pneumonia had a high temperature, that it must be combatted, and I endeavored to keep it down. My usual order was that if the temperature was above 102, tepid body packs or alcohol or tepid sponges should be applied every hour. I am convinced now that in the majority of cases this is not only unnecessary but actually harmful. It means disturbing the child every hour, often waking him up from a sleep, and besides this in most instances, the child hates hydrotherapy in any form and cries and fights and exhausts himself. The only time I use hydrotherapy at the present time is when I think the temperature is causing discomfort and restlessness. Otherwise, regardless of the temperature, I do not use it.

Another instance of meddlesome therapy is the promiscuous use of enemas in children with pneumonia. These are given either to reduce temperature or to cause evacuation of the bowels. Children almost invariably resent enemas and fight against them to the point of exhaustion. There are of course times when they must be used, but mild cathartics will usually take care of

bowel elimination without the exhaustion caused by enemas.

It is of course, important that adequate food be given to a child suffering with a prolonged illness, but the average case of pneumonia in a child does not last more than a week at the most and I think it is unnecessary and unwise to force food in any great amount during this time. In the past, children with pneumonia who would not take food were often tubed so that their caloric intake was kept up. Personally, I think that this is a most pernicious procedure in most cases. The struggle which the child puts up against this procedure can often be of greater harm than value obtained from the food.

The question of giving fluids to children with pneumonia is an important one. I realize perfectly the value and importance of an adequate fluid intake in infants and children suffering with pneumonia. However, the value has been so emphasized in the last few years, that I think we sometimes overdo it. I feel that fluids should be pushed but within reason. The child should not be disturbed every few minutes to give it fluids. An attempt to give food, fluids, and medications all at about the same time should be made so that there is not constant disturbance of the patient. Except in unusual cases, the average youngster will get sufficient if fluid is offered every two hours during the day, and only when it awakens in the night. I believe it is more important to have a record kept of the amount of rest and sleep the child gets than it is to chart the food and fluid intake.

The value of serum therapy in the treatment of lobar pneumonia in children is still a question to be decided. Several writers up to the present time have felt, because of the comparatively low mortality rate of lobar pneumonia in children, the difficulty of getting material for typing of the organism; the difficulty of in-

travenous therapy in children; the severity of serum reactions; that serum therapy was not practical. It seems to me that until we have had a great deal more work done upon this subject, no definite decision can be made. However, the increasing number of reports of the excellent results obtained in the use of pneumonia serum in adults should make us hopeful that it will prove of definite value in children.

It is true that present evidence indicates that there is a great difference in the incidence of the different types of pneumococci in children under 12 years compared to adults. Types I and II are much less frequent in children, and Type IV much more common at the present time. The use of serum therapy is particularly efficient in cases where Types I and II are the infecting organism. Nevertheless, with increased knowledge of the various types which make up Group IV, and with improvement in the potency of serum, we can look forward with hope to the use of serum therapy in children.

Material for typing can be obtained in most children by use of laryngeal swabs or by gastric aspiration. With the development of the Neufeld method, early determination of the type of pneumococci can be made at the present time. Where one has access to adequate laboratory help, one should endeavor to determine early in the disease what organism is the cause of the pneumonia and if it is found to be a Type I or II pneumococcus, serum therapy should be used in the cases which clinically indicate any degree of virulence.

Although serum therapy in the treatment of lobar pneumonia in children may never hold the place which it will in adults, nevertheless, it does offer in many instances a distinct advance in our method of combating this disease, and I believe in the future will be of even greater value.

Asphyxia Neonatorum*

Roy E. Swanson, Ph.D., M.D.**

Minneapolis, Minn.

THE first and most important event that should occur at the completion of the birth of a baby is the establishment of respiration. This should most happily be followed by crying, which, forcing air against a partly-closed glottis must aid in the opening of the atelectatic new-born lung. Henderson¹ asks the question "Why does the baby begin to breathe?" and aptly states that the purpose is clear but the means obscure.

A considerable number of terms appear in the literature in relation to the asphyxiated states in the newborn. The term asphyxia (meaning suffocation) is loosely ap-

plied as a general term, all causes included. Previous to the 18th century, asphyxia meant no pulsation in an artery, in particular below a tourniquet. In the 18th century, it applied mostly to drowning, and soon after, it included death from strangulation and noxious gases. Obstetrically speaking, in its present day usage, we apply it to any baby who fails to breathe at birth, irrespective of cause. Various more specific terms such as apnea, acapnia, anoxemia, hyperpnea, etc., are avoided in this paper in order not to confuse the average reader into whose hands the bulk of this work falls.

The controversy in the literature regarding the rôles played by oxygen and carbon dioxide in the causation and cure of this condition is unfortunate. It has been implied that an accumulation of CO₂, is as much a cause

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**Assistant Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis.

of death as lack of O. It further has been assumed that a deficiency of O killed by producing an excess of CO₂. Haldane and Priestley's classical demonstration proved that CO₂, rather than O, is the chief immediate factor in respiration. Oxygen has been proven not to be a respiratory stimulant, although minor degrees of oxygen-want increase respiration, and profound levels of oxygen-want cause absence of respiration. Whatever the tests for CO₂ tension in the blood show, the practical answer is that the use of CO₂ and O has proven to be of untold value in the establishment of respiration in asphyxia neonatorum. After respiration is established, O becomes the main requirement.

The mortality rate in the first 15 minutes of life is said to be as great as in any subsequent month. It is said that approximately one in twenty babies die in the first 24 hours of life. Asphyxia plays a large part in these deaths, both as a primary as well as a secondary cause. In states with an increasing degree of oxygen-lack, consciousness is lost, respirations cease, the heart beats more and more slowly, and soon a complete collapse of muscle tone is reached resulting in death from asphyxia¹. The ill effects of asphyxia are not limited to the respiration alone, since true respiration is, according to Henderson, a process occurring fundamentally in the tissues. A lack of oxygen produces tissue death, rupture of vessels and hemorrhage even without the trauma of labor (cesarean section). Unfortunately, in autopsy reports on these babies, hemorrhage (cerebral) is many times the principal pathological finding and the underlying causative factors are disregarded. Haldane has said that oxygen-lack not only stops the machine but wrecks the machinery.

The Causes of Asphyxia Neonatorum

The most simple and inclusive list of causes of respiratory failure in the newborn (asphyxia neonatorum) is given by Moncrieff in *The Lancet*. He lists them as follows:

A. Central Causes:

1. Immaturity of the respiratory center.
2. Damage to the center (increased intracranial pressure, edema, hemorrhage.)
3. Narcosis (morphine, nitrous oxide, ether, barbiturates.)
4. Chemical factors (oxygen lack, CO₂ excess.)
5. Circulatory (in utero), cord disturbances, etc.

B. Peripheral Causes:

1. Obstruction to the air ways.
Premature inspiration.
2. Delayed expansion of lung (atelectasis.)
3. Muscular feebleness.
4. Circulatory failure (profound collapse of muscle tone.)

The triad, cerebral hemorrhage, prematurity, and asphyxia represents the greatest causes of post and neonatal death. In a recent study (Robbins) in a Minne-

apolis hospital, approximately 50% of these deaths were in premature infants. When one realizes the immaturity of the centers and the ease with which the premature tissues are injured, this is not at all surprising. It seems obvious that, in spite of the improved pediatric care given to prematures, no great advancement can be obtained in this group without better obstetrical results in the prevention of premature births. The major pathological process in 50% of premature deaths is cerebral hemorrhage.

Damage to the brain centers, in spite of the fact that the newborn's skull is well fitted to withstand increased pressure by virtue of its fontanelles, sutures and yielding brain, is common (Cushing), even in spontaneous labors. Hemsoth & Canavan³ showed microscopic hemorrhage in sections through the medulla oblongata sufficient to cause death in a group of unselected infant autopsies. During the expulsion of the fetus a tremendous difference in pressure may exist up to 250 mm. in excess of atmospheric pressure. The uterus thus causing an increased positive pressure to the fetus in utero, and an excess negative pressure to the head. This latter may at times occur very suddenly. This may result in edema or hemorrhage within the skull, with resultant damage to the center. Excess compression, traction and rotation result in similar injury. Rapid extraction of the after-coming head, without a generous episiotomy or excessive pressure on the after-coming head from above produces even worse injury. The careful use of low forceps after the head has been on the floor for a reasonable time likewise may prevent these injuries.

Opiates are being used much less frequently in labor in the teaching clinics of this country. Their use is being more restricted for rest to the laboring woman rather than for analgesia. Shute & Davis⁴ at the Chicago Lying-In Hospital show that infants born within one or after six hours subsequent to the use of morphine in the mother, show little if any narcotic effect. Between these hours only 50% are affected to any great degree. Morphine may be safe in their opinion if adequate means of resuscitation are at hand. Irving⁵ states that children born from mothers who have received neither analgesic nor anesthetic drugs, breathed immediately after birth in 98.1% of cases. He further states that with the use of nitrous oxide oxygen mixture and ether, 80% breathed at once. In cases where barbiturates were used, 50 to 65% breathed at once. Eastman⁶ believes that chloroform has no demonstrable effect on oxygen saturation of the fetal blood, but its use may be injurious to the mother; that ether produces slight depression of the oxygen saturation, although not sufficient ordinarily to cause injury. Nitrous oxide oxygen mixtures 85 to 15 or weaker and for periods of less than five minutes regularly cause moderate degrees of fetal distress, but in the normal full term, the infant is apparently not harmed. When nitrous oxide and oxygen in concentrations 90 to 10 or stronger are used over periods in excess of five minutes, marked degrees of fetal distress are produced in about one out of three cases and occasionally profound asphyxia neonatorum results. It is wise when

using nitrous oxide oxygen mixtures never to go below 15 per cent oxygen mixtures before the birth of the baby. Do not allow maternal cyanosis to become evident. If deeper anaesthesia is needed, ether should be added or substituted for the gas in the interests of the baby. Ethylene may possibly be safer, but it is more explosive and many delivery rooms are not properly insulated for its use. The more recently used gas, cyclopropane, in mixtures up to 50 per cent with oxygen, appears to offer the best gas so far for obstetrical use, where profound relaxation is not required.

The use of various barbiturates has been steadily increasing in labor. There is much divergence of opinion regarding their action on the fetus and infant. Animal experiments by Berutti⁷ with dial, veronal, luminal, somnifen, evipal and pernocton show that the placenta (in these animals) is very permeable to these drugs. More so to luminal and less so to evipal. These drugs passed to the fetus within fifteen minutes and reached a maximum in five hours. DeLee comments that many babies are somnolent and poor nursers after labors medicated with barbiturates, for as long as 36 hours, and that they probably delay complete opening of the lung for as long as a week. Lewis⁸, reporting on a large series of cases where morphine, scopolamine and the barbiturates were used in labor, found very few babies narcotized from the latter. When a combination was used, the incidence of narcotized babies increased about five times. He comments on the fact that the traumatism of labor is the most important factor influencing this narcosis. Danforth⁹ favors scopolamine and nembutal and he, like his colleague, Galloway^{9a}, states that no fetal deaths could be attributed to their use. Randall of the Mayo Clinic¹⁰ reports the successful use of pentobarbital sodium without fetal distress. Darchman & Shir¹¹ report a high incidence of asphyxia with sodium amytal. Many reports from England and the continent are favorable with a variable amount of asphyxia. It is quite generally thought that morphine causes more asphyxia than do the barbiturates.

The establishment of respiration in the new born is thought to be accomplished by chemical rather than by physical factors. Eastman¹² found the CO₂ tension in the asphyxiated infant to be twice that of the normal baby. He believes that the use of CO₂ for resuscitation is superfluous and even harmful, since there is already an existing acidosis. The oxygen content of the fetal blood in asphyxia, he states, is so low as to be inadequate. He believes that the fetus *in utero* is definitely less sensitive to CO₂. In profound asphyxia, he finds the CO₂ content lowered as a result of replacement by large amounts of lactic acid. Henderson has advocated the use of CO₂ and O as a means of establishing respiration for many years and his work has gained a large following both here and abroad. There is no doubt that inadequate oxygen as well as excess CO₂ is very injurious to the higher centers.

It is now well-established that the fetus *in utero* makes distinct rhythmic respiratory movements weeks and months before birth. These movements are ineffective

in expanding the lung. This fact has impressed Henderson¹³ very much in elaborating his muscle tonus theory on respiration, metabolism and circulation. At birth, external stimuli increases muscle tone. Without muscle tone, blood would stagnate in the tissues and circulation would fail. Henderson's first experiments with dogs thirty years ago proved that over-ventilation killed. Collapse consisted in a failure of circulation rather than of the heart. The injury was to the venous return due to a complete failure of muscle tonus. In situations where we have disturbances of the cord from knots, coiling and prolapse, we promptly get a condition of oxygen want with subsequent collapse of circulation. Vagus action gives us a slower and slower heart until it ceases to beat. A slowing heart is more dangerous than a rapid one. In conditions disturbing placental circulation, such as placenta praevia, ablatio, rupture of the uterus, tears of the cord, toxemias and syphilis with their impaired placental interchange, circulatory disturbances become serious. Abnormalities of uterine contraction, excess stimulation with pituitrin, excess bearing down, all may produce profound circulatory disturbances from injury to the centers *in utero*.

Peripheral causes which are of the most moment to us are obstructions to the air way by meconium, mucus, blood and amniotic fluid; premature attempts at inspiration and delayed expansion of the lung. Muscular feebleness and circulatory failure complete the picture. The diagnosis of atelectasis is sometimes difficult. Breath sounds, if present, may help. X-ray, where respiration is established, is of aid. Attacks of cyanosis, with irregular breathing, constant accumulations of mucus are noted. Atelectasis as a primary condition is probably a grossly exaggerated post-natal cause of death. It has been used many times to cover up unknown causes¹⁴.

Treatment

In the intelligent treatment of asphyxia neonatorum, it is first necessary to establish in one's mind the degree of asphyxia. Is the child merely depressed, borderline or dying¹⁵? For many years asphyxia neonatorum has been divided into asphyxia livida and asphyxia pallida. The general idea being that they are degrees of the depth or length of the oxygen lack. It may also be postulated that these two types represent degrees of injury. Thus the observer, in outlining his contemplated plan of procedure in any given case, should attempt to evaluate the primary cause of the asphyxia. Is it due to anaesthesia, drugs, obstruction, atelectasis, injury or some unknown factor?

Before discussing the detailed treatment of asphyxia neonatorum, a brief review of three important phenomenon in respiration will be reviewed.

Resistance to respiration will result in a decrease of O and an increase of CO₂ in the blood. As a result, the respiratory center will be stimulated and the resulting hyperventilation will wash out the CO₂ excess. If the resistance prevents hyperventilation, an adequate decrease in CO₂ is not obtained. The resulting acidosis may be balanced by an increase in the total CO₂ in the blood as carbonates¹⁶. Henderson's¹⁷ experiments with

dogs, kept in atmospheres of increased CO_2 tension, showed an adjustment of the respiratory center in these animals to the change. A return of the animal to normal CO_2 tensions, produced asphyxia for long periods and frequently death from oxygen lack.

Bohr¹⁸ has shown (Bohr phenomenon) that hyperventilation will wash out CO_2 to a much greater degree than it will increase the oxygen saturation of the blood. Oxygen in the alveolar air, under ordinary pressure, will saturate the blood as well as when a considerable increase in oxygen tension exists. If the CO_2 tension is maintained and the alveolar oxygen tension much reduced, the blood will lose its oxyhemoglobin saturation and cyanosis will result. If the alveolar oxygen remains the same and the CO_2 tension is markedly reduced, cyanosis will disappear. With a low CO_2 tension, oxygen is not freely broken off from oxyhemoglobin, and the tissues suffer even though the oxygen tension of the blood is high. The disappearance of cyanosis ushers in a more serious situation to threaten the life of the patient. It is essential to maintain a proper CO_2 tension in the blood and alveolar air.

The Hering-Breuer¹⁹ reflex is based on vagus action. Distention of the lung stimulates nerve endings in such a way that inspiration is halted and expiration initiated. Deflation in turn stimulates nerve endings to the end that expiration is stopped and inspiration begun. Thus inspiration causes expiration and *vice versa*. This reflex makes the use of intratracheal insufflation most logical.

The treatment of the average case of delayed breathing should be successful if the following principles are observed:

1. Extreme gentleness.
2. Clear air passages with a bulb or trap aspirator.
3. External warmth.
4. Establish drainage by posture.
5. Avoid severe external stimuli.
6. Forward traction of the tongue.
7. Determine absence or presence of pharyngeal reflexes.
8. Have CO_2 and O mixtures, under controllable pressure, available.
9. Avoid suspension by the feet if cerebral hemorrhage is suspected.
10. Limit asphyxia to as short a time as possible.

If respiration does not start and all of the above principles have been followed, more drastic methods must be used. These will depend upon the equipment at hand.

1. Mouth to mouth breathing. This method has been superseded by more scientific methods. The only reason for its existence is its immediate availability. It still, however, has many advocates.

2. Drinker respirator. This machine is expensive and is not always available. It requires valuable time to place the baby and close the cover. Attendants in the delivery room are not always well informed in its use. The amount of negative pressure necessary to inflate the

atelectatic lung in the newborn is not always reached. This machine has not lived up to expectations in the newborn.

3. Inhalation of CO_2 (5 to 7 per cent) and O with a mask as advocated by Henderson & Haggard²⁰. Slight positive pressure is maintained and the mask is raised 15 to 20 times a minute.

4. The intratracheal catheter. This can be placed either by touch or by direct vision with a pharyngoscope²¹. This method is superior to all others since it assures patency of the air way and permits introduction of CO_2 and O mixtures under pressure. This may initiate respiration because of the Hering-Breuer reflex and assures one of a pressure sufficient to dilate the lung. It assures one of lung ventilation without respiratory movement. Its more frequent use is urged.

5. Drugs. Adrenalin, alpha lobelin, and coramine are the three most commonly used drugs. They are most frequently used as a last resort and are usually disappointing.

Summary

1. The cause and treatment of asphyxia neonatorum, a term loosely applied to all babies not breathing at birth, is discussed. The views of many writers are included.

2. Certain phenomena of respiration are reviewed with the hope that we may be better able to evaluate various recommended procedures.

3. The use of CO_2 and O mixtures are of great assistance in the establishment of respiration in the newborn and should be available in all delivery rooms and nurseries.

4. Mechanical machines have a greater place in maintaining respiration than they have in initiating it.

5. Intratracheal insufflation with CO_2 and O under controlled pressure should be more universally used.

6. Drugs for stimulating respiration are frequently disappointing.

7. Gentleness in resuscitation is recommended.

8. The best treatment for asphyxia neonatorum is its prevention.

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The Management and Feeding of the Premature Infant*

Albert V. Stoesser, M.D., Ph.D.**

Minneapolis, Minn.

PREMATURITY refers to infants who are born before the 36th week of gestation and weigh less than $5\frac{1}{2}$ pounds (2,500 grams) and who usually differ anatomically and physiologically from normal full-term infants. Infants having a low birth weight are not necessarily premature, as the smaller size may be an inherited characteristic; nor are all infants who have been delivered prematurely necessarily below the average weight of full-term infants. In general, however, prematurely born infants and immature full-term infants who are small at birth require special care. In the following paragraphs the term premature is used to include immature full-term infants, as well as infants born prematurely, coming under the weight classification cited above.

Premature infants, because of underdevelopment, are at a great disadvantage when compared to normal infants. Due to shorter intra-uterine life, they show under-development of their heat-regulating mechanism. The body temperature tends to fall below normal on slight exposure to cold, and to rise above normal due to high surrounding temperatures. Where the surrounding temperature is not subject to careful regulation, daily variation of body temperature of as much as 5°F . has been observed.

The respiratory center is also underdeveloped, which accounts for the large incidence of respiratory failure, and for the frequency of irregular respirations punctuated with long periods of apnea (transient cessation of respiration). These periods may be so long at times as to lead to death from suffocation. Sometimes, however, the apnea of premature infants may be due to intracranial hemorrhage involving the respiratory center, rather than to underdevelopment.

As a corollary of an immature gastrointestinal tract the digestive capacity of premature infants is low; intestinal motility is impaired, and absorption of food is poor. Normal digestive enzymes may be present in reduced amount. The gastric capacity of the premature baby is likely to be disproportionately small and per unit of weight the food and food accessory requirements are greater than those of the normal full-term infant.

In view of these illustrations of physical immaturity, it naturally follows that the premature infant's ability to adjust to a feeding formula and to cope with infection is much less than that of the full-term normal infant. With these two factors in mind, the Pediatric staff of the Minneapolis General Hospital has worked

out a schedule for the care of the premature infant which has given very satisfactory results in that the mortality rate of these infants has been consistently dropping from year to year. This is very clearly shown in Table I which reveals that a rather small number (6.6 per cent) of premature babies now die after the forty-eighth hour of life. In order to present in a practical way the program which has given these results it was thought best to offer suggestions in the form outlined below.

Reception of the Premature Infant

Prematurity is an emergency condition and is frequently precipitate. Preparedness at the time of birth frequently means the difference between life and death to the infant. Two things are of predominant importance: (1) prevention of chilling or exposure over too long periods of time and (2) asepsis. When the possibility of premature birth is suspected, one must be prepared. In the nursery the heating unit of the incubator (or whatever equipment is employed) is turned on as soon as word is received from the physician. A design for a premature incubator is shown in the accompanying illustrations. (Figures 1, 2, 3 and 4).

This equipment is simple and inexpensive. It consists of a white enameled wooden box, supported on four legs with roller casters. When the cover is down, the size of the opening in it may be regulated by sliding panels. The head end of the bassinet in the incubator may be lowered to facilitate the removal of mucus from the infant's respiratory passages. The temperature is controlled by a thermostat and humidity may be added at any time. All of this is obtained in a rather compact portable apparatus.

When the temperature of the incubator and bassinet reaches 100°F ., the heating unit is turned off but the temperature is not allowed to fall below 98°F . When the baby arrives the temperature is adjusted so as to maintain body temperatures between 98° and 99.6°F . The heating capacity of the incubator should be such that this can be attained.

In the obstetrical delivery room the baby should be immediately placed in a warm receiving blanket or in sterile absorbent cotton covered with two layers of gauze, and if his condition permits, and there is no maternal emergency, the cord should be allowed to pulsate for two or three minutes before ligation, during which time it will receive an additional 1 to 2 ounces (30 to 60 cc.) of blood. The baby is placed in the prepared bassinet. The cord may then be tied. A soft absorbent diaper is folded and placed at the buttocks to catch meconium and urine. This is changed as required.

*From the Pediatric Division of the Department of Pediatrics, University of Minnesota, at the Minneapolis General Hospital, and prepared expressly for the special Pediatric issue of THE JOURNAL-LANCET.

**Assistant Professor of Pediatrics, University of Minnesota.



Figure 1. The premature incubator with cover lowered. The sliding panels for the opening in the cover are shown.

Great care should be taken at delivery to remove mucus from the air passages by carefully wiping the nose and mouth with a piece of soft gauze. The head should be held dependent so that secretions and mucus which have accumulated in the respiratory passages may escape.

Premature infants should not be bathed during the first day or two. It is preferable to cleanse small infants with warm liquid petrolatum or olive oil. The genital and anal regions should be carefully cleansed with sterile water, avoiding trauma.

During the first sixteen hours the baby is observed frequently by the nurse. Orders should be given to notify the physician immediately if cyanosis, irregular respiration, convulsions, pallor or hemorrhage develop. Resuscitation may be efficiently performed within the bassinet.

Maintaining the Body Temperature of the Premature Infant

Unless otherwise ordered by the physician, the temperature is taken just before feeding time and not more often than every four hours. The body temperature of the premature infant should be maintained between 98° and 99.6°F. and always recorded. Body temperatures lower than 98°F. over long periods of time are probably more hazardous than those slightly above 100°F.

The room temperature should be between 72° and 80°F. and the incubator temperature should be 80° and 86°F. or more, depending in each case on the amount of heat necessary to maintain the premature infant's



Figure 2. The incubator with cover raised. The rod and ratchet combination shown on the right permits lowering or raising of the head end of the bassinet. The thermostat for automatic regulation of the temperature is also visible.

body temperature as stated previously. The higher temperature of the bassinet is necessary for the smaller infants. Regulation of incubator temperature is effected by thermostatic control, by turning on and off the electric heating units or lights, by lowering the cover or by hot water bottles, depending upon the type of incubator employed.

The humidity of the room or the incubator is likewise of paramount importance. Relative humidity should be kept between 45 and 55% saturation—particularly in the case of very small premature babies.

Room or incubator temperature and humidity should be recorded at the request of the physician.

No premature infant should be removed from premature care until it can maintain a normal temperature at all times with the heating unit entirely turned off. This must be considered before a premature infant is discharged.

In view of the many external surroundings which require regulation, a special room should be reserved for the use of the premature baby. In the hospital this is frequently possible and in the home every effort should be made to provide isolation and the desired physical surroundings.

Treatment of Asphyxia

All premature infants should be carefully watched for cyanotic attacks during the first days of life, as such attacks may develop suddenly and without warning.



Figure 3. The front of the incubator. The position of the humidifier is shown. It is turned on or off by the middle switch which has a pilot or safety light attachment.

Infants below 3.3 pounds (1500 grams) must be watched very closely. If cyanosis develops shortly after birth the first thought is the removal of mucus.

Mucus is removed from the throat and mouth most effectively by aspirating with a soft rubber ear syringe or a soft rubber catheter attached to a syringe for suction. The mouth is not swabbed out with gauze, as a slight abrasion of the mucous membrane might occur.

To remove mucus or amniotic fluid from the larynx, trachea, or bronchii, the infant is held with the head dependent, the trachea and larynx are gently stroked toward the mouth and suction is applied to the pharynx.

If the premature infant does not begin to breathe after removal of any obstruction of the air passages, oxygen with 5 to 10% carbon dioxide may be advantageously used, administered by nasal catheter. Rate of flow should be between 60 and 120 bubbles per minute. The infant size Drinker respirator has been tried with little success.

Artificial respiration without undue trauma may be employed. For this purpose the infant should be suspended by the feet, the forehead resting lightly on the bed or table, so as to deflect the chin and straighten out



Figure 4. The floor of the incubator. The four electric heating units and the two lights controlled by the thermostat, and the opening for the vapor from the humidifier are shown.

the trachea, and then the chest is compressed between the thumb of the right hand resting on the back and the four fingers of the same hand resting on the anterior wall of the chest. The act should be repeated from 15 to 30 times a minute by compressing and suddenly relaxing the chest wall.

Careless handling and traumatizing the infant, or too rapid performance of artificial respiration, is productive of more harm than good and must, therefore, be avoided.

If the premature infant is cyanotic but breathing, insert a small nasal catheter into the nostril so that the tip of the catheter extends to the edge of the soft palate, and give a mixture of 5 to 10% carbon dioxide in oxygen continuously until cyanosis is relieved. It may be desirable to repeat this procedure at regular intervals for several days in case cyanosis persists. Avoid irritation of the nostril.

One minim of epinephrine (1:1000) may be given every hour to the very small infants, until they show definite signs of activity. That may be for three or four days and then the dose may be increased to a maximum of 3 minims every four hours. Some very weak premature infants may require 3 minims every four hours routinely until they are quite definitely active; then every eight hours, every twelve hours, finally, every twenty-four hours until discontinued by the physician. The adrenal glands are probably not very active in these very small premature babies.

TABLE I. MORTALITY RATE OF PREMATURE INFANTS

Six Year Period—Minneapolis General Hospital

Year	1930-1931*			1931-1932*			1932-1933*			1933-1934*			1934-1935*			1935-1936*		
Total Number of Prematures	148			155			139			145			146			120		
No. of Deaths—	No.	%	Av.Wt.	No.	%	Av.Wt.	No.	%	Av.Wt.	No.	%	Av.Wt.	No.	%	Av.Wt.	No.	%	Av.Wt.
Less than 1 hr.	7	4.7	1505	5	3.1	1160	12	8.6	960	17	11.7	1069	5	3.4	1153	3	2.5	1222
1 hr. to 16 hr.	18	12.1	1553	22	14.0	1126	19	14.0	1158	15	10.5	1526	17	11.6	1443	14	11.7	1505
16 hr. to 48 hr.	9	6.0	1489	6	3.7	1820	6	4.4	1372	4	2.8	1240	6	4.1	1332	7	5.8	1924
Total up to 48 hr.	34	22.8		33	20.8		37	27.0		36	25.0		28	19.1		24	20.0	
48 hr. to 10 days	34	23.0	2255	27	18.0	2237	5	3.5	1915	1	0.7	1425	5	3.4	1723	4	3.3	1590
More than 10 days	22	15.0	2197	42	27.0	2194	5	3.5	2033	10	6.9	1662	7	4.9	1694	4	3.3	1907
Total over 48 hr.	56	38.0		69	45.0		10	7.0		11	7.6		12	8.3		8	6.6	
Grand Total	90	60.8		102	65.8		47	34.0		47	32.6		40	27.4		32	26.6	

*July first to July first.

Any evidence of asphyxia or cyanosis at any time should be reported to the attending physician immediately.

Intracranial Hemorrhage

If there is evidence of intracranial hemorrhage or hemorrhagic disease of the newborn, whole or citrated blood warmed must be given deep subcutaneously or intramuscularly at once, 1/3 to 1 ounce (10 to 30 cc.)—depending upon the size of the baby. This blood need not be grouped or matched if given intramuscularly, but should be Wassermann negative. This will be administered by the physician but the set-up should be ready. If bleeding persists, the procedure is repeated every 24 hours for two to three days.

Hemorrhages from the skin, mouth, rectum and genitalia, especially between the third and sixth day after birth should be reported to the physician immediately.

Care of the Eyes

One per cent silver nitrate solution or 15 per cent argyrol is used of course to prevent ophthalmia neonatorum. This should be followed by normal saline solution instilled in the eyes. Not infrequently the application of silver nitrate will result in some inflammatory reaction of the conjunctiva in the first 6 to 12 hours after its application. This occurs more frequently in premature infants than in full-term infants and is usually relieved by cold applications. It is not to be confused with the more serious specific ophthalmia which develops on the second or third day. In case of doubt a microscopic examination of the purulent discharge should be made.

In all cases an old silver nitrate solution which has undergone decomposition should be avoided, as such solutions are far more likely to irritate the sensitive conjunctiva.

Care of the Mouth and Nose

Every effort must be made to avoid trauma of the mucous membranes of the nose and mouth because of the danger of secondary infections. After the third or

fourth day the anterior portion of the nostril may be gently cleaned with small pieces of absorbent cotton.

Prevention of Respiratory and Skin Infections

Upper respiratory infection, with complications, is one of the chief causes of mortality in premature babies. The nurse or mother in attendance must pay strict attention to even the slightest detail.

Anyone with upper respiratory infections, however slight, should avoid all contact with the premature infant.

Scrupulous care of the hands of nurses, doctors, or those attending the premature baby must be observed before handling the baby, and especially before feeding. The hands should be soaped several times, rinsed thoroughly between each soaping. The hands should not be washed and then the mask adjusted or the door opened.

Masks must be made, or obtained, and changed frequently. The mask is to be worn over mouth and nose.

If the baby develops any evidence of respiratory infection or any skin lesion, isolate it at once. Skin lesions, especially impetigo contagiosa, must be carefully examined and then may be treated by the nurse or mother under the direction of the physician. Silver nitrate (15 per cent), gentian violet (5 per cent in alcohol), tincture of merthiolate (1:1000) and/or ammoniated mercury (2 per cent) have all been used with success. The physician should leave orders that any sudden spread of the lesions must be reported at once.

Birth Weight Loss

Loss of body-weight during the first few days of life occurs so constantly in full-term infants that moderate losses must be considered physiological. This is also true of premature infants but their loss is relatively greater than that of the full-term infants and they regain their birth weight more slowly, frequently requiring three weeks or more.

The loss in weight of premature babies should not average more than 7 to 8% of the birth weight.

TABLE II. SUMMARY OF THE DATA FROM A CLINICAL EVALUATION OF PREMATURE FEEDING FORMULAE

FEEDING FORMULAE	Below 2,000 Grams			Over 2,000 Grams		
	Breast Milk With Casec	Evap. Milk Mixture	Skim. Milk Olive Oil* *	Breast Milk With Casec	Evap. Milk Mixture	Skim. Milk Olive Oil**
Number of Cases	12	17	27	39	54	53
Birth Weight in Grams	1812*	1798	1741	2370	2347	2247
Minimum Weight	1685	1679	1639	2249	2207	2120
Total Initial Weight Loss	125	114	100	121	140	127
Day of Minimum Weight	6	7	3	4	4	4
Day Birth Weight Regained	14	14	8	8	11	10
Caloric Intake per Kilogram on That Day	124	134	108	108	114	117
Discharge Weight in Grams	2634	2680	2710	2732	2721	2696
Day of Discharge	37	49	36	20	25	23
Caloric Intake per Kilogram on That Day	143	156	147	137	138	146
Average Weight Gain in Grams per Day	35	25	35	30	26	34

*Except for number of cases all figures are averages.

**The new feeding called olac.

Total Fluids

After the first few days the total fluid intake must be maintained at from one-sixth to one-eighth of the body weight in each 24 hours. The sum of the water and milk intake is used to determine the total fluid intake.

Fluids (Water) and Feeding

Although modifications may be made by the physician, it has been found to be highly satisfactory to permit the premature infant to rest for the first 16 hours of life during which time no fluid or feeding is offered.

Prematures weighing 3.3 pounds (1,500 grams) or less. Water is given at the end of the sixteen hour rest period. Offer 10 cc. (2 teaspoonfuls) every 2 hours during the remainder of the first day and thereafter every four hours. Increase the amount offered by 2 cc. each feeding until 1½ ounces (45 cc.) are offered. When this volume is reached, decrease by 1 cc. with each administration until 1 ounce (30 cc.) is offered. This decrease in water must be made because the milk feedings are gradually being increased.

If breast milk is available, begin the second day by offering 5 cc. (1 teaspoonful) of boiled breast (human) milk with 2 per cent calcium caseinate (Casec) every 4 hours and increase by 1 cc. with each administration until about 1¼ ounces (50 cc.) are offered. Any further increase or more rapid increase in feeding depends upon the progress made. Where breast milk is routinely available and stored under aseptic conditions, this may be used without additional boiling. The addition of calcium caseinate to the breast milk has been found to definitely reduce the number of cases in which frequent liquid stools have developed, and has led to a most satisfactory and consistent daily gain in weight.

Where breast milk is not available, either one of two formulae may be used with little fear that the premature infant will not be able to adapt itself to the feeding.

A mixture consisting of equal parts of unsweetened evaporated milk and water with the addition of three per cent dextri-maltose has given good results. However, recently a new preparation has been tried and the response of the premature baby to it equals or even surpasses that of breast milk. This response may be observed in Table II which is a summary of the data obtained after eighteen months clinical trial of the new formula. A complete analysis of this data will be presented in another communication.

The new mixture is composed of a combination of skimmed milk, virgin olive oil, calcium caseinate and dextri-maltose with a small amount of halibut liver oil. Its composition is based on the observations of Holt, Tow and Marriott in connection with the absorption of fat and the assimilation of protein in the premature infant. Since it can be obtained now in the dry or powdered form*, it may be employed in a dilution of 1 ounce of the powder to 5 ounces of previously boiled cooled water, the caloric value of this being approximately the same as the boiled breast milk with the two per cent calcium caseinate.

Little can be expected in the way of increasing weight until about 45 calories per pound (90 calories per kilogram) are administered. Later the infant will require approximately 50 to 55 calories per pound of body weight and after the first month as much as 60 calories per pound may be needed. In exceptional cases it may be necessary to feed 80 to 100 calories per pound, but in such cases these infants are markedly underweight for their fetal age. In the present routine of feeding not much attention is paid to the total calories. The idea that so many calories per pound or per kilogram should be given has been overemphasized. A good plan is to feed the premature baby an amount sufficient for an adequate and consistent gain in weight.

Prematures weighing between 3.3 and 4.4 pounds (1,500 to 2,000 grams). Begin by giving water at the

*Prepared by Mead Johnson & Co., Evansville, Indiana, and identified as Olac.

end of the 16 hour rest period. Offer 2 teaspoonfuls (10 cc.) of water every 2 hours for the remainder of the first day and thereafter every 4 hours. Increase by 2 cc. with each administration until almost 2 ounces (55 cc.) are offered; then decrease by 2 cc. until 1 ounce (30 cc.) is offered.

Begin on the second day by giving 2 teaspoonfuls (10 cc.) of boiled breast milk with 2 per cent calcium caseinate, or the skimmed milk-olive oil mixture every 4 hours and increase by 1 cc. with each administration until 2 ounces (60 cc.) are reached. Any further increase or any more rapid increase requires an order by the physician.

Prematures weighing 4.4 pounds (2,000 grams) and more. Begin by giving water at the end of the 16 hour rest period. Start with 3 teaspoonfuls (15 cc.) of water every 2 hours for the remainder of the first day and thereafter every 4 hours. Increase by 2 cc. with each subsequent administration until 2 ounces (60 cc.) are offered; then decrease by 3 cc. each feeding until 1 ounce (30 cc.) is given.

On the second day, offer one-half ounce (15 cc.) of boiled breast milk formula, or if necessary the supplemental feeding every four hours and increase by 2 cc. with each feeding until 1½ ounces (45 cc.) are offered. The amount offered is then increased by 5 cc. daily, to 2½ ounces (75 cc.). Following this, additional changes in the feeding depend upon the progress of the case and must be ordered by the physician. Reference to Table III will probably help to avoid any confusion which may arise in connection with the routine of feeding outlined above.

The infants weighing between 2,000 and 2,500 grams may frequently be able to nurse quite early at the breast. Weighing before and after nursing is of paramount importance to determine how much milk has been received. In all cases of prematurity an effort should be made to promote maternal lactation. If the infant is initially too weak to nurse, the breasts should be hand expressed or emptied with a breast pump at regular intervals.

The best test of satisfactory and adequate feeding is a steady gain in weight. The physician should be notified each morning as to whether the infant will take or needs an increase in feeding. Weigh once during the first 24 hours, then every day for three days and thereafter every third day or twice a week. If the baby has lost in weight, it must be weighed daily until it has again made a good gain in weight.

Feeding Time Schedule

After the second day water is given every four hours five or six times a day; milk is given two hours after the water feeding every four hours, usually six times a day.

5 A. M.—Milk	6 A. M.—Milk
7 A. M.—Water	8 A. M.—Water
9 A. M.—Milk	10 A. M.—Milk
11 A. M.—Water	12 Noon—Water
1 P. M.—Milk	2 P. M.—Milk
3 P. M.—Water	4 P. M.—Water

5 P. M.—Milk	6 P. M.—Milk
7 P. M.—Water	8 P. M.—Water
9 P. M.—Milk	10 P. M.—Milk
11 P. M.—Water	12 P. M.—Water
1 A. M.—Milk	2 A. M.—Milk

This schedule shows five water feedings and six milk feedings daily. It has the advantage over six water feedings and six milk feedings in that it permits the premature to have a little rest period during the night.

Additional Fluids

From the second to the fourth day after birth it is often desirable to give 3 1/3 to 5 ounces (100 to 150 cc.) of Ringer's solution (physiological saline) or Hartmann's solution by hypodermoclysis, using the inner aspect of the leg just above the knee for the site of the injection. This should be administered very slowly, preferably by continuous drip. This is a good method for reaching the required fluid intake if the baby is losing rapidly in weight during the first few days of life. The only objection is that it may disturb the infant.

Whole Blood

Many physicians administer whole blood to all premature infants early on the second day of life. When this procedure is performed, 1/3 ounce (10 cc.) is given to small babies and up to 1 ounce (30 cc.) to the larger babies. The blood is injected deep subcutaneously into the back below the scapulae.

Repeatedly observations have been made that the premature infants who cannot take adequate feeding and who are not gaining satisfactorily in weight may be benefited by receiving additional whole blood. The physician may find that this procedure will often put an end to a refractory period during which there has been little or no gain in weight.

Methods of Giving Water and Milk

Three methods are commonly employed:

1. Catheter or tube method is frequently used.
2. Medicine dropper (protected by rubber tip) is used occasionally. The Breck feeder may be tried but it has the disadvantage of allowing too rapid feeding.
3. Bottle feeding is used but conservation of the baby's strength then is to be considered.

Many babies weighing less than 4.4 pounds (2,000 grams) must be fed by catheter. If this is done a Number 10 or 12 soft French catheter, for small prematures, and a Number 14 French catheter, for larger prematures is employed. Catheter may be marked with silver nitrate four inches from the tip. The sterile catheter or tube is carefully passed, not allowing it to go beyond the four-inch mark. There should be a catheter for each infant. The baby may be supported in a semi-recumbent position, and after becoming quiet is slowly fed. When the procedure is completed, the tube is kinked and removed quickly. The infant is supported in the sitting position in the crib to allow for the expulsion of any air. The baby is watched carefully at

TABLE III. ROUTINE OF FEEDING FOR THE PREMATURE INFANTS

Milk—cc. Water—cc.						Milk—cc. Water—cc.						
1 2 3			1 2 3			1 2 3			1 2 3			
First Day:						Sixth Day:						
						1st F.	29	34	55	42	52	57
16th hour			10	10	15	2nd F.	30	35	55	41	54	59
18th hour			10	10	15	3rd F.	31	36	55	40	55	60
20th hour			10	10	15	4th F.	32	37	55	39	52	55
22nd hour			10	10	15	5th F.	33	38	55	38	50	54
						6th F.	34	39	55	—	—	—
Second Day:						Seventh Day:						
1st F.			5	10	15	1st F.	35	40	60	37	48	51
2nd F.			6	11	17	2nd F.	36	41	60	36	46	48
3rd F.			7	12	19	3rd F.	37	42	60	35	44	45
4th F.			8	13	21	4th F.	38	43	60	34	42	42
5th F.			9	14	23	5th F.	39	44	60	33	40	39
6th F.			10	15	25	6th F.	40	45	60	—	—	—
Third Day:						Eighth Day:						
1st F.			11	16	27	1st F.	41	46	65	32	38	36
2nd F.			12	17	29	2nd F.	42	47	65	31	36	33
3rd F.			13	18	31	3rd F.	43	48	65	30	34	30
4th F.			14	19	33	4th F.	44	49	65	30	32	30
5th F.			15	20	35	5th F.	45	50	65	30	30	30
6th F.			16	21	37	6th F.	45	51	65	—	—	—
Fourth Day:						Ninth Day:						
1st F.			17	22	39	1st F.	46	52	70	30	30	30
2nd F.			18	23	41	2nd F.	47	53	70	30	30	30
3rd F.			19	24	43	3rd F.	48	54	70	30	30	30
4th F.			20	25	45	4th F.	49	56	70	30	30	30
5th F.			21	26	50	5th F.	50	58	70	30	30	30
6th F.			22	27	50	6th F.	50	60	70	—	—	—
Fifth Day:						Tenth Day:						
1st F.			23	28	50	1st F.	50	60	75	30	30	30
2nd F.			24	29	50	2nd F.	50	60	75	30	30	30
3rd F.			25	30	50	3rd F.	50	60	75	30	30	30
4th F.			26	31	50	4th F.	50	60	75	30	30	30
5th F.			27	32	50	5th F.	50	60	75	30	30	30
6th F.			28	33	50	6th F.	50	60	75	—	—	—
F—Feeding.						Eleventh Day:						
						Further increases in feeding depend upon progress made.						

F—Feeding.

1—Prematures 3.3 lbs. (1500 grams) or less.

2—Prematures 3.3 and 4.4 lbs. (1500-2000 grams).

3—Prematures 4.4 lbs. (2000 grams) and more.

the time of feeding and for a while after the tube is removed to see if it is going to regurgitate. If regurgitation should occur, the head and shoulders are lowered at once and the baby is turned face downward. The regurgitated milk is wiped from the mouth and face and the baby is re-fed 15 to 20 minutes later. This nursing care is one of the most important factors in preventing otitis media and bronchopneumonia due to aspiration.

Babies weighing over 4.4 pounds (2,000 grams) may often be fed by medicine dropper. Patience and care on the part of the nurse are prerequisites to success. Drop by drop the fluid is placed on the dorsum of the tongue, trickles down, and is swallowed. Babies usually begin to nurse from the bottle when they approach 5 pounds (2,300 grams) in weight.

Milk or water should not accumulate in the pharynx. It should be ascertained that the baby is swallowing. The accumulation of milk or water in the pharynx will strangle the infant and aspiration is inevitable. This is highly undesirable and often results in aspiration pneumonia.

Gastrointestinal Disturbances

If regurgitation or vomiting occurs, no further increases in feeding are made. It may actually be necessary to decrease the volume of feeding and increase the

number of feedings. This will be determined by the physician.

The physician should always leave an order to be notified immediately if diarrhea (frequent, watery stools) makes its appearance. This condition requires an increase in the fluid intake and Hartmann's solution is given by hyperdermoclysis. Weak tea or one-half strength Hartmann's solution may be employed in place of all feedings for 12 to 24 hours, after which feeding is again started by using small amounts of the breast milk—calcium caseinate (casc) preparation, or the skimmed milk-olive oil formula (olac), and gradually increasing the volume.

If there is no improvement, whole blood is given deep subcutaneously on the second day. Do not temporize. Repeat Hartmann's solution by slow, continuous infusion, giving about 3 1/3 ounces (100 cc.) to small prematures and as much as 6 ounces (200 cc.) to the large infants.

If the premature baby is not gaining in weight and the stools continue to be loose, weigh daily until there is a weight increase, and normal stools.

Vitamin Requirements

After 10 days or as late as 14 days, premature infants which reach or are between 3.3 and 4.4 pounds (1,500 and 2,000 grams) should receive 5 drops of oleum percomorphum, 50% or of viosterol in halibut liver Oil twice daily. This is increased to 10 drops twice a day. Pure strained orange juice (one teaspoonful) is also given twice a day.

Premature infants which reach or are 4.4 pounds (2,000 grams) or more in weight, will receive oleum percomorphum, 50% or a standardized cod liver oil. If the former is used the amounts given are as indicated in the paragraph above. If cod liver oil is used, start with an amount equivalent to one-half teaspoonful twice daily and increase to one teaspoonful twice a day. As long as the infant receives feedings by tube, the cod liver oil can be added to the milk, but after the feedings are given by bottle, the cod liver oil should be administered separately. About 1 to 2 teaspoonfuls (5 to 10 cc.) of orange juice is offered twice a day.

If vomiting or diarrhea occurs, stop antirachitic and antiscorbutic preparations immediately for the time being.

Anemia

Premature babies tend to develop a low hemoglobin very readily. A hemoglobin determination should be made no later than the fifth week of life, and if low, should be repeated weekly. Some form of iron administration should be followed, beginning at the latest by the fifth week of life.

Liver extract and/or ferric ammonium citrate with or without copper sulphate have given a very satisfactory response. The infant may receive each day 1 cc. of a 10 per cent solution of ferri et ammonii citras for each pound or 2 cc. for each kilogram of body weight, and

$\frac{1}{2}$ cc. of a 0.5 per cent solution of cupri sulphas per pound or 1 cc. of 0.5 per cent solution per kilogram of body weight. Both preparations are placed in the breast milk or in the feeding formula. The copper may be discontinued after a short period of administration. It may be given again later.

Suggestions Regarding Discharge From the Hospital

Before discharge the premature should be carefully examined and should be free from respiratory infections and skin lesions. The physician may desire a final hemoglobin for the records and may possibly order X-rays of the long bones, and of the bones of the hand in order to be sure that there is no bony evidence of syphilis.

The infant should be able to nurse from the mother's breast or to take expressed breast milk or the artificial feeding formulae, easily from the bottle. The mother can be asked to come in a few days before discharge in order to determine how well the infant nurses at the breast. If an artificial feeding is ordered, it must be remembered that as the amount of milk per feeding increases it may be necessary to order more feedings rather than to continue to increase the amount of milk

each feeding, as stomach capacity may be limited. This can be done by substituting milk for some of the water feedings given during the day. As a result, in some instances the infant will be fed every three hours. A little water should then be given between feedings.

Directions must be given the mother for the administration of standardized cod liver oil or any especially potent antirachitic, and orange juice. If oleum percomorphum is available, it is to be preferred to cod liver oil, because of smaller dosage.

Conclusions

Cardinal points in the management and feeding of the premature infant in the order of their importance are:

1. Intelligent nursing care on the part of the nurse or mother.
2. Maintenance of proper environment from the moment of birth.
3. Prevention of upper respiratory infections and skin disorders.
4. Establishment and maintenance of adequate fluid intake and feeding.

A Few Common Dermatoses of Infancy and Childhood*

Carl W. Laymon, M.D.**

Minneapolis

THE purpose of this paper is to briefly discuss a few of the most common cutaneous disorders of childhood especially from the standpoint of therapy as carried out by dermatologists in this vicinity. In an attempt to learn "just what to do and when to do it" regarding the frequent dermatoses which confront the practitioner almost daily, one is usually confused by the multitude of therapeutic agents mentioned in the common pediatric or dermatologic texts and is left without a definite, acceptable form of therapy to follow. Whenever possible references will be cited for more detailed discussions of the condition in question since a complete exposition, even of therapeutic procedures alone, cannot be given.

MacKee and Cipollaro¹ partially prefaced their recent text on skin diseases in children as follows: "The dermatoses of infancy and childhood are interesting and important for several reasons. There are in the first place a number of cutaneous affections that are seen only in infancy or childhood; a few are peculiar to adolescence.

Many of the chronic adult dermatoses begin in early life. By detecting these conditions in the early stage of evolution much can be done to prevent future suffering and disfigurement. Finally, most of the skin diseases common to adults are also encountered frequently in children, but the eruption complex is likely to be modified by factors peculiar to youth."

Eczema

It seems essential to cease being satisfied with the vague diagnosis "eczema" both for advance in the solution of the "eczema problem" and for the management of the individual case. Within the past few years a few definite and distinct conditions have been separated from the general eczema group, among which are atopic dermatitis, contact dermatitis, seborrheic dermatitis and certain mycotic infections. Eczematous mycotic infections and contact dermatitis do not present a great problem in infancy and childhood since they are much less frequently seen than in the adult. Although seborrheic dermatitis is far from a rarity especially in infancy—atopic dermatitis of the infantile and childhood type still defies analysis both as to etiology and therapy in a large number of cases. The term disseminated neuroderma-

*From the Division of Dermatology, University of Minnesota, H. E. Michelson, M.D., Director; and the Dermatology Service, Minneapolis General Hospital, S. E. Sweitzer, M.D., Chief, and prepared expressly for the special Pediatric issue of THE JOURNAL-LANCET.

**Instructor of Medicine, University of Minnesota.

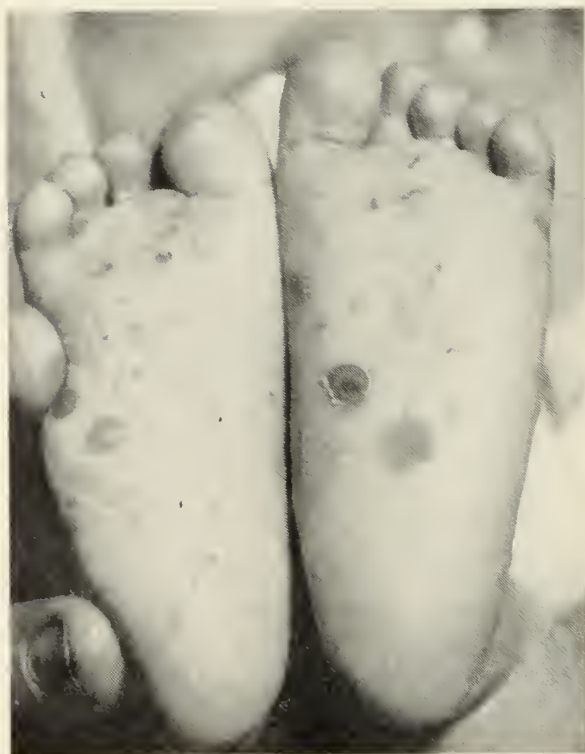


Figure 1. Pustular scabetic lesions on the soles of an infant.

titis, weeping and exudative in infants and chronic and lichenified in older children, is regarded as synonymous with atopic dermatitis. This disease occurs in atopic (hay fever and asthma) families and is distinct from acute or chronic eczema of the contact type.

The clinical picture of infantile eczema is well known. At first the infant presents a papulovesicular eruption on the cheeks which may extend to the outer aspects of the legs, forearms, wrists and forehead. There may be irregular areas of erythema and a tendency to wheal formation. The eczema in severe cases may become generalized and assume the appearance of an erythroderma. Many infants with atopic dermatitis recover completely by the end of the second year. Other cases continue into childhood usually in the form of infiltrated, lichenified pruritic plaques in the antecubital and popliteal spaces and on the face and sides of the neck.

It would seem that from the association of atopic dermatitis with other allergic diseases such as hay fever and asthma, the family history of allergic disease, and the frequent positive findings in scratch and/or intradermal testing that the logical therapeutic approach lies in attempting to eliminate as far as possible those specific allergens suspected as being etiologically important. Furthermore the "specific" or "allergic" attack of the problem would appear less complicated in infancy and early childhood on account of the fewer contacts with food or inhalant substances prone to sensitize the patient. The diet of the infant is much less complex than that of the adult and studies have shown that environ-



Figure 2. Multiple ruptured bullae in impetigo neonatorum.

mental (inhalant) allergens play an increasingly important rôle with the aging of the child as compared to food in infants. Hill² found that scratch tests to environmental allergens were positive in only 10% of 38 eczematous infants under 1 year of age, while the percentage rose to 50 in 49 children from 2 to 12 years of age. Peck³ obtained similar results. Hill and Sulzberger⁴ traced the evolution of atopic dermatitis from its beginning, through infancy, childhood and adult life. Based on skin tests egg, wheat, and milk were the most common reactors during the first year of life. Reactions to inhalant allergens were rare but of these silk was apparently the most important. In childhood (2 to 12 years) reactions to inhalants were more frequent coinciding with the previously mentioned findings of Hill and Peck. While in many cases removal of the specific substances to which the patient reacted positively on skin testing, cured or improved the dermatitis this was not true in all instances. Peck found that elimination diets were of practical value only in the infantile cases.

Factors other than allergic ones undoubtedly are influential in the pathogenesis of atopic dermatitis. In a review of allergy in dermatology Sulzberger⁵ called attention to the observations of Péhu and Woringher that 50 to 90% of eczematous infants show positive wheal reactions to skin tests with egg white. Many of these can be shown to possess specific reagins to egg by means of the Prausnitz-Kustner method of passive transfer. Yet many of these infants have never been exposed to egg white and even admitting sensitization in utero many

infants show no exacerbation of the eczematous process when egg is fed. The significance of reactions to egg white in atopic eczematous infants has never been satisfactorily explained.

Without denying the importance of the allergic study and managements of atopic dermatitis in infancy and childhood it is my impression that most practitioners will in general secure the best results from intelligent dermatologic therapy. Even the best trained allergists and dermatologists with every means of cutaneous testing at their command frequently encounter great difficulty in the alleviation of this condition and are forced to admit that the allergic approach is of definite value in the exception rather than the rule. Specific desensitization as yet is usually unsuccessful in atopic dermatitis.

Certain fundamental measures are prerequisite to the successful management of all eczematous individuals. By far the best results are obtained when the patient is hospitalized. Rest and relief from pruritis are essential. In certain instances sedation is necessary, bearing in mind however that opium and its derivatives are contraindicated regardless of the severity of the itching. In infants especially a properly adjusted splint to prevent bending the arm at the elbow is necessary to make scratching impossible. Medications containing local anesthetics are potent contact sensitizers and should be used only with caution.

In the acute, erythematous oozing phase moist compresses of saturated boric acid solution or dilutions of 1:10 of Burow's solution are of the greatest service. As the acuity subsides mild "shake" lotions such as calamine are of value. In chronic, sluggish or lichenified areas ichthylol (3.5%), naftalan (5-10%) or crude coal tar (1.5%) incorporated in zinc paste (Lassar's paste without salicylic acid) are frequently efficacious. Although my experience with the so-called "white tar" has not been great, the impression has been gained that it is inferior to ordinary crude coal tar. Extremely stimulating preparations such as strong tar pastes or varnishes, sulfur, chrysarobin, ammoniated mercury, *etc.*, must be used with care lest intense aggravation of the process result. Proper application of a medicament is as important as the drug itself and thorough instructions should be given to the patient. Pastes should be cleansed off with olive oil before fresh applications are made. Soap and water as a general rule prove aggravating to eczematous skins.

Specialized methods of therapy such as X-rays are not within the scope of this discussion. In the therapy of eczema it is far better to know well the basic actions and proper application of a few appropriate remedies than to know a little or nothing about a large number of prescriptions. The physician who follows this principle will alleviate or cure cases which have defied a multitude of therapeutic agents given without exact knowledge of their properties.

Scabies

The clinical picture of scabies is constituted by two chief elements: (a) the burrow and inflammatory

changes caused directly by the *acarus scabiei* and (b) lesions caused indirectly by scratching, secondary infection, *etc.* The result is a multiform picture which in itself enables the well trained eye to diagnose a typical case without difficulty.

The female *acarus* is chiefly responsible for the symptomatic eruption in scabies, the male taking little part in the burrowing into the skin. The latter process results in the characteristic scabetic lesion, the burrow in which the parasite lays her eggs and deposits excreta. The thinnest parts of the skin are usually selected such as the webs between the fingers, the flexor surfaces of the wrists, axillae, abdominal wall and genitalia especially in the male. In individuals of poor personal hygiene no part of the body is exempt in cases of long duration, although as a rule the head, face and back are spared. In infants special attention should be paid to the palms and soles, since lesions are not infrequently found in those locations. Moreover the usual rule that the face is uninvolved does not hold true in infants, infection taking place from contact with the mother's breast.

As the parasite enters the epidermis, inflammatory changes are the consequence, usually in the form of a small papule, vesicle or pustule. In children especially a pustular or impetiginous eruption on the hands should always suggest scabies. The characteristic burrow, which is an irregular, sinuous or rarely a straight line in the skin is not always found. In a recent article Stokes⁶ emphasized the examination of the skin with a hand lens for detection of these lesions. In addition to the above lesions excoriations, impetiginous or ecthymatous infections, wheals and secondary eczematization may be seen. Acute inflammatory cutaneous changes with scabies are much more easily provoked in children, hence pustular complications are more frequent than in the adult.

As a rule the proper treatment of scabies is both simple and effective. Most antiscabetic medications contain parasitocides such as sulfur, betanaphthol, or balsam of Peru frequently combined with an abrasive such as potassium carbonate. A thorough soap and water bath to open the burrows is essential to the success of any form of therapy in scabies. The U.S.P. compound sulfur ointment (Wilkinson's ointment) is highly effective though messy, malodorous and somewhat irritating. Although used in full strength for older children, it should be diluted one half with zinc paste for use in infants and young children. Following the preliminary bath the ointment is applied from the neck to the feet (never on the face). In the case of average severity in a patient with good hygiene 3 daily applications are usually sufficient. The treatment is furnished with a second cleansing bath. The subsequent irritation which often follows the use of Wilkinson's ointment is soothed by a bland preparation such as zinc paste. In patients who have severe scabies or whose personal hygiene is not good, such as those who are treated in a large city hospital dispensary practice the time of treatment is extended to six days. Sweitzer and Tedder⁷ and later Sweitzer⁸ reported favorable results with the use of pyrethrum ointment in a large number of cases of

scabies treated at the Minneapolis General Hospital. Fantus and Cornbleet⁹ recently reviewed the treatment of scabies as carried out in the Cook County Hospital:

All clothing that has been in contact with the skin during the course of the disease must be boiled, laundered or dry cleaned (which means a thorough immersion in naphtha). The patient should take a prolonged warm bath, thoroughly scrubbing with soap and brush. After drying the skin the remedy is applied to the entire skin below the clavicles. Sulfur ointment, preferably diluted, is to be used night and morning for a total of six times. Then the bath is repeated and the clothes worn during the treatment should be boiled, laundered or dry cleaned. The "clean up" is the most important part of the treatment and also the most difficult to get carried out thoroughly, as well as the most expensive. For children, one-half or one-fourth the strength of the ointment used for adults should be prescribed. For those who have an idiosyncrasy against sulfur, 5 or 10% betanaphthol ointment should be resorted to. "One day cures," such as the Danish treatment, are apt to be too irritative.

Continuance of the itching means (a) that the treatment was not thorough enough, (b) reinfestation from contacts, (c) residual irritation of the skin, possibly aggravated by the treatment, or (d) habit formation.

(a) To exclude the first possibility, one may repeat the treatment, which should always suffice.

(b) Infested contacts must be eliminated by treatment of these, or otherwise.

(c) Residual irritation requires that the skin be soothed by calamine lotion or other bland application, or by 10% borated cold cream if it is excessively dry. If there is much trauma or if there are many raw areas from wild scratching, these should be cared for even before instituting measures for the scabies itself. Colloid baths and calamine lotion or liniment help to prepare a badly scratched and traumatized skin for the more specific and irritating scabies ointment. For pus infections, half strength ammoniated mercury ointment may be used after sponging with mercury bichloride solution to remove the crusts.

(d) Habit requires psychotherapy, possibly plus calamine lotion as a placebo.

Stoke's method as recently outlined is as follows:

First Night: Bathe with hot water and soap, soaking well and scrubbing all burrows and pimples open with brush. Rub in ointment over whole body except face and scalp. Special attention to hands, arm pits, waist, nipples, groin and genitals (external).

Next Morning: Rub ointment again, without bath. Wear same underwear.

Second Morning: Bathe thoroughly, do not apply ointment, powder the body with borated talcum all over. Then put on fresh underwear. Have all bedding changed (sheets, pillow cases).

Send blankets and everyday suit to dry cleaner.

Send linen and underwear to laundry.

Return to the office one week from today.

Use no more ointment unless ordered.

Stokes stated that almost any preparation containing Peru balsam or volatile sulfides or ether or betanaphthol in concentration of not less than 10% for adults would be effective. These percentages should be as a rule reduced one half for infants and children.

Regardless of the type of medication used it must be remembered that the patient does not cease to itch immediately upon the death of the acarus and subsequent courses of parasiticide preparations should not be repeated for a week or two until the irritated skin has an opportunity to quiet down. The treatment of all the affected members in a family is important to prevent repeated transference of the disease.

Impetigo Contagiosa

Impetigo is one of the most frequent cutaneous affections encountered in children and may in infants become extremely severe, occasionally terminating fatally. In the common form the lesions begin as vesicles or bullae, the contents of which are rapidly transformed into pus. The secretion then dries, forming at first honey-yellow crusts which seem to be "stuck on" the skin. These later become reddish-brown or brown from blood, pus, and dirt. The lesions, which arise as a result of streptococci being implanted in the skin, are located as a rule on the exposed surfaces of the body such as the face, hands and knees. The eruption may vary considerably in extent and severity.

The poorly named *pemphigus neonatorum* is not a separate disease but in reality a bullous infantile variant of impetigo contagiosa. The eruption begins in the first week or two of life usually about the thighs, buttocks or back, frequently spreading to the extremities and face. The bullae arise rapidly and often in great numbers and easily rupture to leave large areas of raw denuded skin in the widespread cases. The disease may assume epidemic form in hospitals and in such epidemics fatalities often result.

In impetigo contagiosa the type of treatment depends largely upon the stage of the disease when the patient is seen. When large numbers of adherent crusts are present they are best removed by softening, mildly antiseptic ointments such as 2 or 3% ammoniated mercury, diachylon or boric acid. Such therapy in itself may bring about a cure. In the bullous stage and after the crusts have been thoroughly removed, painting the bases of the lesions with 10% silver nitrate or a 5% aqueous solution of gentian violet is efficacious. Children suffering with impetigo must of course be excluded from school.

In the bullous form in infants strict isolation technique must be enforced especially in hospitals. The bullae may be carefully clipped and the bases painted with 5% silver nitrate or gentian violet. Ointments as a rule are not well tolerated. Leiner's lotion containing ½% salicylic acid and 1 to 3% cinnibar is frequently beneficial.



Figure 3. Hemangioma of the face.

Urticaria

The most important variety of urticaria encountered in infants and children is the papular type or lichen urticatus. Its onset is, as a rule, during the first year of life. The characteristic lesions are small yellowish-red or pale red pruritis vesico-papules distributed most frequently on the extensor surfaces of the extremities and occasionally on the face and trunk. The papular lesions may or may not be accompanied by ordinary, evanescent, urticarial wheals. Constitutional symptoms, except those resulting from loss of sleep in a few cases, are lacking although secondary excoriations and eczematization are not uncommon.

In a thorough study of the condition Walzer and Grolnick¹⁰ investigated especially the allergic aspects of papular urticaria. Specific (elimination) therapy based on skin tests was of no avail. Likewise nonspecific measures, such as removal of foci of infection physiotherapy and removal of skin irritation produced no improvement. The prognosis as to duration and cure must be guarded, although the condition usually disappears spontaneously in a later childhood or at puberty. Personal experience¹¹ with papular urticaria coincides with that of Walzer and Grolnick.

Verrucae

Warts rarely present diagnostic difficulty, although their treatment when they occur in certain locations such as the soles or under and about the nails, occasionally tries the acumen of the most skillful therapist. Destructive measures such as cauterization or electro-desiccation offer the most reliable and most easily controlled means of cure of common warts in the usual locations. Chemical agents such as salicylic, nitric and trichloroacetic acids, though not entirely condemned, are less dependable and more difficult to control. Plantar, sub-ungual, and peri-ungual verrucae lend themselves less readily to destructive measures on account of inaccessibility (nails) and subsequent morbidity due to pain (soles). Nevertheless such methods are entirely acceptable^{12,13}. Irradiation in the form of unfiltered X-rays is successful in a fair percentage of these cases^{14,15}. In carrying out such treatment the lesion is exposed as much as possible by cutting away the nail or, in the case of plantar warts the overlying callous. The surrounding normal tissues



Figure 4. The same lesion a year later after therapy with carbon dioxide snow.

are thoroughly shielded with lead. Doses of 800 to 1200 R frequently produce desiccation and disappearance of the verruca in from 3 to 5 weeks.

The flat type of wart (*verruca plana juvenilis*) is especially common in children, though also seen in adults. The lesions are usually from 1-3 mm. in diameter, just perceptibly raised above the plane of the surrounding skin, and are either color of normal integument, gray or brown. They appear often in great numbers upon the faces of children, especially along lines of irritation. As in other warts, their development, duration and disappearance are erratic. The administration of protiodide of mercury by mouth may effect a cure. Touching the lesions with an extremely fine desiccating current may achieve a satisfactory result although the procedure is rather tedious if the number of lesions is great. Sulpharsphenamine intravenously in doses of .1 gram per 25 pounds body weight has been used with varying degrees of success^{14, 16, 17}. Since its administration is not without danger it should be used only after other means have failed. Both local¹⁸ and intramuscular¹⁹ injections of bismuth compounds have been advocated in the treatment of warts.

Hemangiomas

As is the case in verrucae, vascular nevi present more of a therapeutic than diagnostic problem. The various types of hemangiomas depend upon a congenital hyperplasia of a circumscribed area of the cutaneous vascular system. The clinical lesion is thus dependent upon the size of the affected vessels. In the flat so-called "port wine stain" or *nevus flammeus* there is a superficial plexus of dilated capillaries; in *hemangioma simplex* or "strawberry mark" large vessels are involved; and in the cavernous hemangioma there are extremely large dilated blood spaces of either arterial or venous origin or both. No organ or area in the body is exempt from involvement in hemangiomas²⁰. Cutaneous lesions are especially frequent about the face, head and arms. Although either sex is affected the lesions are more common in females.

Port wine nevi are best left alone since all manner of therapy has been attempted with very little success. X-rays and radium in dosages within the margins of safety will not eradicate these nevi, and dire results have

resulted from such therapy. At the cancer institute of the University of Minnesota recently a young man was treated for a highly malignant squamous cell carcinoma originating within an area of radiodermatitis which followed the treatment of a nevus flammeus.

Strawberry nevi do not afford such a gloomy outlook. Carbon dioxide snow repeatedly applied to the lesion in doses of 10 to 30 seconds often results in great improvement or cure. Subsequent applications should not be made until all reaction from the previous treatment has subsided and improvement is no longer occurring. The final result of course is a scar which, however, is usually white, soft, flat and supple.

Cavernous hemangiomas vary greatly in surface size, depth, and appearance. The cutaneous aspect is not always a true guide as to their exact extent. Surgical excision is not frequently feasible on account of the danger of severe hemorrhage and the inability to accurately determine the entire extent of the growth. Other therapeutic methods consist in (1) irradiation²¹ and (2) the injection of sclerosing fluids²².

In general the older the child the less response may be expected from irradiation on account of the maturity of the cells making up the nevus. Cavernous hemangiomas overlying bone may cause erosion. For these reasons therapy should be instituted as soon as possible after birth rather than delayed until the infant or child is old enough to co-operate better with the physician. When the lesion begins to grow cure is more difficult to effect.

At the University of Minnesota irradiation in the form of low voltage X-rays is used frequently in the treatment of these nevi. Doses of 500-600 R either unfiltered or through 1 or 2 mm. of aluminum are given and the effect noted. Only after improvement has ceased (usually after several months) is such a dose repeated, and even then rarely over two treatments are administered. Radon implants are occasionally used about cavernous hemangiomas of the mucosae.

The sclerosing agents in most frequent use are sodium morrhuate (5%) and absolute alcohol. In the former an attempt is made to enter the dilated blood space and inject a few minims of the solution, the exact amount depending upon its size. Injections are repeated after the reaction has subsided and the lesion is not changing.

This method is used more frequently in older children or adults or in case irradiation has failed to obliterate the lesion. No attempt is made to penetrate the vessels in using alcohol. In certain instances the resulting inflammatory reaction following the repeated injection of 3-8 minims of alcohol eventually leads to fibrosis and ultimate shrinkage of the nevus. In all injection methods improvement is slow and the patient should be warned that many months will be required to achieve a satisfactory result. A perfect result, especially from the cosmetic standpoint, should not be promised.

Carbon dioxide snow is also of service in the eradication of purple discoloration on the surface of cavernous hemangiomas which sometimes remains even after the deep blood vessels have been obliterated.

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The Trend of Mortality in Insured Children*

Karl W. Anderson, M.D.**

Minneapolis, Minn.

THERE can be no question that life insurance companies have made a definite contribution to the field of medicine, both from a prognostic and a therapeutic standpoint, and through them the medical

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**Assistant Medical Director, Northwestern National Life Insurance Company.

profession has had called to its attention certain continuous changes in both the therapeutic and diagnostic fields, and some fallacious beliefs have been corrected.

Some of these beliefs were due to the fact that the individual doctor would develop his ideas and practices as a result of his personal experience, and based his con-

clusions on a very inadequate number of cases. In his whole lifetime the doctor may not see sufficient cases in any one field for a proper statistical study. However, through the various organizations with which the doctor is associated, a sufficient number of cases have been recorded by mutual co-operation so that results are being studied in larger groups, and in this way the purely personal viewpoint is being gradually discounted.

Medicine has more and more realized the importance of proper statistical study. Long ago the insurance companies adopted the statistical method as an aid in solving many of their problems. However, it is only comparatively recently that this medium has been used in medical science. Now it is being applied in all its fields of endeavor, and the result is that medicine has at last a very formidable instrument in evaluating the various types of treatments for the many diagnoses that are now being made.

One of the things that life insurance companies worked out was the life expectancy table for the average American newborn. The life expectancy in the United States has been extended greatly in the past quarter of a century. In 1900 the newborn in the United States had an average life expectancy of 39 years, and in 1935 this had been extended to 59 years. We have been able to obtain this information through biometric science. On further study it has been proven that practically all this improvement has been taking place at the younger ages, particularly in the first few years of life. From the available data now there is a serious question as to whether adults who live to be age 40 have not a shorter life expectancy than in the past. While there has been a very marked improvement in the death rate in the communicable diseases, particularly in children, this has been offset by the very large and steady increase of deaths due to diseases of the cardiovascular system.

In the past it has been estimated that 80 per cent of the population died before the age of 40. Now 80 per cent live to be 40 years of age and over. More people, therefore, are living to ages above 40, and naturally a greater number are subject to diseases of the cardiovascular system. Yet, in the light of the marked increase in a number of diseases in this group, there has been little improvement in their treatment. It is now apparent that our problem is twofold: first, to continue the improvement in mortality in the younger ages; and second, to develop some means by which the cardiovascular diseases can be combated, as they are now the most common cause of death.

In this paper I am particularly interested in the former group—that is, the mortality of children up to age 15—and I should like to speculate as to the reasons for the splendid conservation of life since the turn of the century in this group, and as to whether or not there is going to be any marked change in the trend in child mortality in the future.

In mentioning a few of the factors that have been responsible for the improvement in this group in the past, although not necessarily mentioning them in their right proportions, one must first consider the economic

situation in this country. There has been a steady improvement in wage scales and living and working conditions of the masses, so that the average family has had more money to spend in child care—medically and socially. Second, one must realize that the geographic and climatic conditions in this country, as a whole, are conducive to healthful living. Third, the educational system available to the masses from the beginning has made it possible for the average individual to appreciate the value of the medical treatments and preventative measures available. Fourth, I believe that the heterogeneous mating of pioneer stock in this country has been a very large factor, but has seldom been given any recognition. As a rule, only the healthy individuals dared to migrate to this country, as it took sturdy men and women to stand the hardships of pioneering. Naturally, this type was bound to produce healthier children.

There are other factors that should be considered, but I have mentioned only some of the more obvious ones, and have left for the last the one which is probably the most important—that is, the relentless war waged upon communicable diseases by the medical profession, its branches and allied sciences. However, the battle is not won, nor has there been a truce declared. Every child who dies is proof of our imperfect knowledge, our carelessness of purpose, and of the fact that there is yet considerable work to be done in the medical world and by public health education. This is made particularly evident when we consider the unnecessary deaths that are occurring each day in industrial sections of the United States, as there has been a tremendous difference between the mortality in this group and the mortality among children from the better homes. A study of the statistical material of insurance companies has brought this forcefully to our attention.

One of the most valuable sources of information that the medical profession has is the study of necropsy material. This probably has been more effective than any other single factor in increasing the knowledge of the medical profession, and second only to that in importance is the information obtained in the statistical studies of various groups of diseases causing death. Therefore the statistician is a most valuable ally to the medical profession, and is a medium through which much knowledge has been developed. The statistician, using analytical methods, has been able to show us the various trends of mortality in the past, and to prognosticate the future rather accurately.

Life insurance companies were one of the first to appreciate the value and scientific application of biometrics to their medical problems. Through their actuarial and medical departments they were able to develop much needed information that has been helpful in insurance selection, and also to the medical profession. By combining their materials the life insurance companies have been able to obtain a sufficient number of cases in the various disease groups so that they can be studied in an effectively significant fashion. The Joint Committee from the Association of Life Insurance Medical Directors and the Actuarial Society of America have been

studying this combined material, and have been able to show not only the trend of mortality of various diseases and their effect on the longevity that the various diseases have, but also the fallacy of many of our medical practices and beliefs.

The average doctor does not have an opportunity to study his patients over a long period of time. The usual illness is of only short duration, and people getting over the effects of an operation are soon discharged from the doctor's care as cured according to his records. Therefore he does not fully or always realize the effect that these illnesses and operations might have upon the future health of the individual, and it is only by studying large groups that we find the answer to some of these questions.

Most of the large clinics, hospitals, and universities have or are developing statistical departments, and those that have such a department would not dispense with them any more than they would with the necropsy department. As a result of this widespread use of statistical methods, most of us now have developed an attitude of watchful waiting, reserving our opinions on new therapeutic measures until their value has been proved or disproved by this cold analysis. The prophylactic value of the diphtheria immunization, smallpox vaccine, and typhoid inoculations, has been confirmed statistically. There is still considerable doubt, however, concerning the value of the treatment and preventive measures in other contagious diseases, such as mumps, whooping cough, and scarlet fever. The newer treatments for these conditions must have statistical confirmation before one can be sure of them.

In studying the mortality figures in the United States registration area from 1900 to 1936, one can appreciate how much has been accomplished during these years. Chart I shows, among other things, that the rate of communicable diseases has decreased from approximately 400 deaths per 100,000 in 1900 to 96.5 in 1934. This is in the registered population of the United States as a whole, and differs from what would be expected if one considered only the insured lives of children. It would also be different if one compared it with the insured lives of children outside of those of the industrial grade.

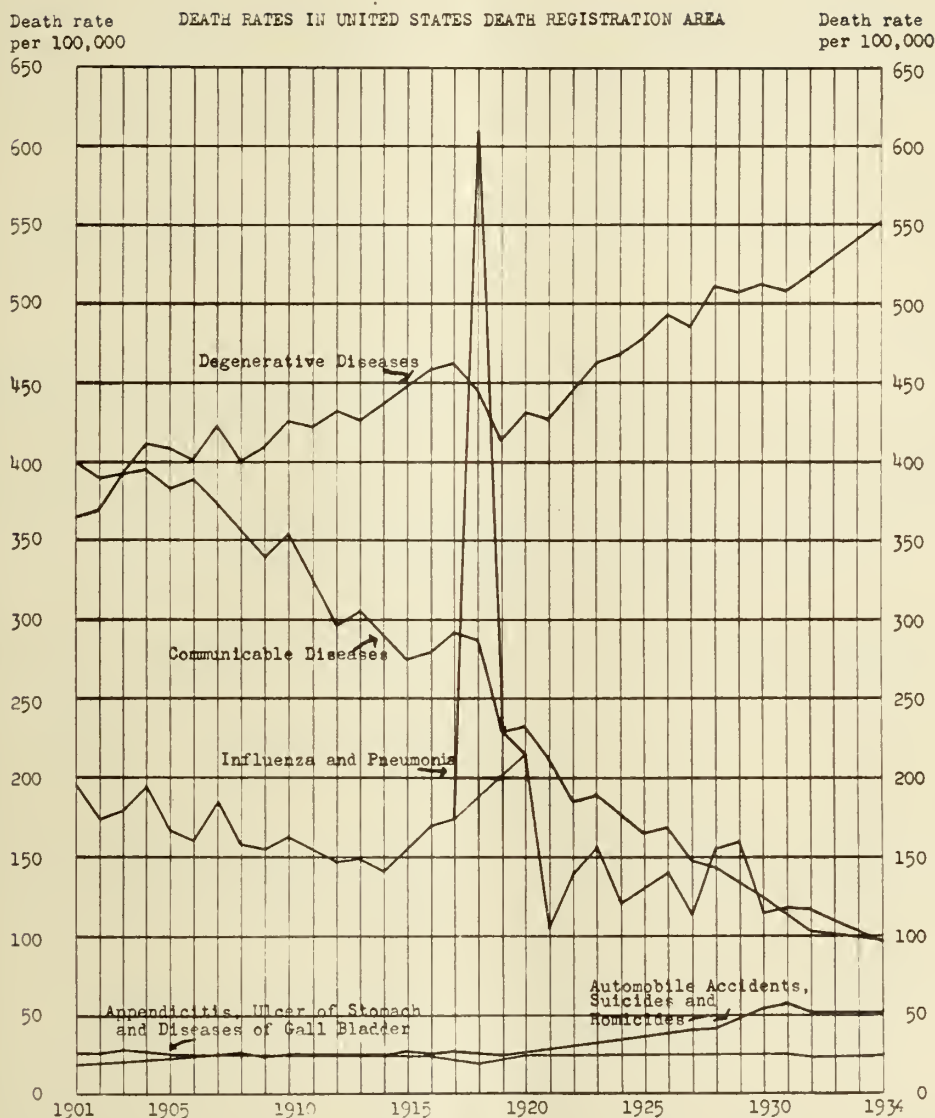
There are two types of insurance sold for children, and in discussing insured children's lives and their mortality one must keep these two types of insurance clearly in mind. One is the so-called "regular" business, meaning the usual policy sold by companies on a standard basis to parents or guardians whose children live in a good environment, and where their social and economic situation is above the average. These policies are usually sold in amounts of \$1,000 or more. The second group is the so-called "industrial" type, and the insurance is generally in small denominations—\$100 to \$500. These latter children are usually living in the metropolitan areas of the larger cities, and in this environment we find a greater number of undernourished children living in crowded unhygienic surroundings. Often their parents are foreign-born, first generation immigrants. The first group are better protected against the elements and dis-

ease, and therefore are less subject to accidents and communicable diseases. In this group, as would be expected, there is a much better mortality than in the industrial grade.

We have no large compilation of figures as yet to study in the first group, but we hope that in the next year a joint study by most of the companies selling children's policies will be available. However, in a recent analysis by the Northwestern National Life on all their children's policies sold between 1925 and 1935, in which approximately 19,100 lives were insured, some interesting data were obtained. This company does not sell industrial business. Table 2 shows the number of exposures and the deaths by ages. It also shows the mortality per 100,000 when this material is statistically treated on that basis. The average mortality experience on Northwestern National Life's children's policies issued between 1925 and 1934 at ages 1 day through age 14 is 101 per 100,000. If we exclude those issued between age 1 day to 1 year and include only those issued between ages 1 through 14 years, the experience of the Northwestern National is improved to 80 per 100,000. This compares favorably with the experience of other companies writing practically the same type of business. This figure naturally is considerably lower than would be expected for the same age group of children in this country as a whole, as this class is without doubt a selected group. They come from the better type of homes in which there is more financial stability, as illustrated by the fact that the greater number of these policies are taken on the more expensive forms, particularly the 20 Payment Life, and for at least \$1,000. Keeping these facts well in mind, and considering the comparison between this type of insurance and the industrial type of insurance, the mortality figures in the industrial group naturally will show a marked increase.

Chart 3 shows the mortality for 1936 of the industrial business issued by the Metropolitan Life Insurance Company. It is a more comprehensive study, as it shows the causes of death as well as the mortality. But in order to compare similar ages one would have to change the Northwestern National figures from 1 day through 14 years to 1 year through 14 years. In the industrial business of the Metropolitan the total mortality for 1936 was 260.5 deaths per 100,000, in comparison with the Northwestern National Life experience of 80 deaths per 100,000 in the same age group. There are many factors that must be considered in making the comparison. The Northwestern National policies are sold to a more urban population, and the people living in the midwestern states have a much better mortality than those living in the eastern states. However, even keeping these factors in mind, the difference indicated in the comparison is entirely too great. It is evident that these children need a new deal, in spite of the marked improvement in mortality in the past 25 years. Another interesting fact to be noted in studying this chart is that five times more deaths occurred in 1936 in children 5 years or younger than occurred in children from 5 to 14 years of age, so it becomes evident that the greatest problem at the pres-

CHART I



ent time is with the younger ages, particularly in the first two years of life.

The most common causes of death in 1936 for the Metropolitan Life Insurance group were influenza and pneumonia, and when one studies the statistics of these two diseases for the past 21 years one cannot help but realize that there has been practically no improvement in their mortality. Another thing of interest is the fact that whooping cough up to age 5 is the largest single cause of death in the communicable disease group. I believe that the medical profession and the population as a whole do not realize the high rate of death that is associated with whooping cough, and that the improvement in mortality in this disease has not been in proportion to that found in other infectious diseases.

Accidents will always be a major problem, even though in the younger ages most of these accidents could be prevented by a little more thoughtfulness exhibited

by adults in charge of children. These points should be emphasized more in the public health publications, popular magazines, and daily papers.

CHART II
Northwestern National Life Insurance Company's Juvenile Mortality Experience

Attained Age	Northwestern National Life's Data		
	Exposed	Deaths	Death Rate per 100,000
0	1969	13	660
1	2354	12	510
2	2574	7	271
3	3062	7	229
4	3603	4	111
5	4247	6	141
6	4663	6	129
7	5205	4	77
8	5617	3	53
9	5916	2	34
10	6779	2	30
11	7137	5	70
12	7696	3	39
13	8316	0	—
14	8972	5	56

CHART III

Death Rate per 100,000 From Specified Causes of Death.
Ages Under 15 Years

Metropolitan Life Insurance Company, Weekly Premium-Paying
Industrial Business, 1936.

Cause of Death	Death Rate per 100,000			
	Under 15 260.5	Under 5 600.0	5 to 9 147.8	10 to 14 116.6
All Causes				
Typhoid Fever	.7	.5	.8	.7
Measles	2.6	7.0	1.7	.2
Scarlet Fever	5.1	7.3	6.4	2.4
Whooping Cough	5.1	17.8	.6	—
Diphtheria	4.9	9.5	5.2	1.4
Influenza and Pneumonia	64.4	191.1	19.2	13.6
Influenza	9.7	25.1	4.2	3.5
Pneumonia— All forms	54.7	166.0	15.0	10.1
Cancer—all forms	2.7	3.8	2.3	2.4
Diabetes Mellitus	1.1	1.5	.7	1.3
Diseases of the Heart	8.2	4.9	6.7	11.9
Diarrhea and Enteritis	21.0	73.9	1.6	.4
Appendicitis	9.7	9.7	9.8	9.6
Suicides	.2	—	.1	.4
Homicides	.3	.3	.4	.3
Accidents, Total	34.1	48.7	32.5	24.9
Auto Accidents	12.0	13.1	14.0	9.2

Chart 4 shows the mortality for the Metropolitan Life Insurance Company's weekly premium-paying industrial business from 1911 to 1935. It presents a still more comprehensive study. It shows the mortality for all causes and the figures for the individual diseases. A progressive improvement is evident in most diseases, including pneumonia and influenza, with the exception of those of the upper respiratory tract. There has not, however, been a very striking improvement in pneumonia and influenza. The diseases of the pharynx, tonsils, mastoids, and ear show no improvement from 1911 to 1935, and it is very hard to understand why this is true. It makes one wonder whether or not the usual treatment of these conditions should be continued. The most common treatment in the past for these conditions has been the tonsillectomy. It again raises the question as to whether or not the wholesale removal of tonsils, as has been done in this country in the past, is justified. I do not believe the question of the advisability of the

CHART IV

Standardized Death Rates per 100,000 From Specified Causes of Death. Ages 1 to 14 Years
Metropolitan Life Insurance Company, Weekly Premium-Paying Industrial Business
1911 to 1935

Year	All Causes	Typhoid Fever	Measles	Scarlet Fever	Whooping Cough	Diphtheria	Tuberculosis (All forms)
1935	207.7	.9	6.7	7.5	4.5	6.5	11.8
1934	213.7	1.3	7.5	7.1	6.3	6.5	13.9
1933	210.8	1.3	4.1	6.8	3.8	7.6	14.1
1932	225.6	1.5	4.5	7.4	5.3	11.2	15.9
1931	264.9	1.9	8.1	8.2	6.0	12.5	18.4
1930	269.7	1.9	6.9	6.4	6.3	16.1	20.4
1929	319.8	1.7	7.0	6.7	9.4	23.9	21.8
1928	319.5	2.3	12.0	6.4	8.1	25.9	21.6
1927	309.7	4.0	9.1	7.2	8.8	27.3	23.1
1926	363.8	3.3	22.4	8.5	14.8	25.3	27.1
1925	332.6	3.8	6.9	8.1	10.3	26.7	25.0
1924	358.6	3.6	15.7	10.3	10.6	33.9	27.9
1923	394.9	4.7	25.3	11.3	15.8	42.8	28.3
1922	396.4	4.6	13.6	12.6	9.0	51.1	29.4
1921	433.1	6.2	9.4	18.1	13.3	66.1	32.3
1920	511.1	6.2	25.1	15.4	21.5	61.0	40.8
1919	502.9	6.3	10.1	9.9	9.6	56.4	45.3
1918	803.5	10.5	23.6	8.6	31.7	51.8	53.6
1917	558.9	10.4	30.3	14.7	16.2	66.1	53.4
1916	546.9	10.8	29.4	10.4	19.3	58.3	54.9
1915	493.6	10.6	17.5	12.4	16.0	60.3	55.3
1914	544.5	14.1	20.9	26.3	19.7	72.5	59.3
1913	594.1	16.6	36.9	34.3	20.0	77.3	60.2
1912	562.6	15.7	23.5	26.1	17.3	69.7	58.8
1911	623.7	17.8	34.0	35.4	23.9	78.6	63.5

Year	Diseases of the Ear	Diseases of the Mastoid Process	Dis. of Pharynx and Tonsils	Accidents† (Total)	Automobile Accidents	Influenza or Pneumonia‡	
						5 to 9 Yrs.	10 to 14 Yrs.
1935	3.0	2.1	5.8	28.0	12.1	21.9	14.0
1934	2.8	1.9	5.2	31.3	13.2	17.0	11.0
1933	2.8	2.3	6.1	30.2	13.4	21.2	11.9
1932	2.7	2.0	5.9	31.7	13.5	19.8	14.7
1931	2.5	1.8	6.3	35.0	16.1	21.3	14.3
1930	2.3	2.0	5.9	37.3	16.3	20.9	13.1
1929	2.9	1.7	5.9	42.1	18.1	30.6	18.3
1928	2.5	2.1	6.2	41.5	17.1	28.0	18.4
1927	2.5	1.7	6.6	45.3	18.2	24.9	14.3
1926	2.7	1.5	5.9	42.3	17.3	25.2	16.8
1925	2.3	1.3	6.0	45.3	17.4	26.5	19.1
1924	3.0	1.5	5.7	46.9	17.2	23.6	16.0
1923	2.7	1.6	5.6	44.9	17.1	28.0	19.7
1922	2.7	1.1	6.2	47.9	17.0	29.3	19.3
1921	2.7	1.5	8.4	47.9	15.7	30.4	17.9
1920	2.9	1.6	6.7	48.0	15.6	49.6	32.6
1919	2.1	.9	6.6	52.2	14.7	72.3	53.8
1918	2.6	.8	5.5	53.4	13.7	199.6	158.9
1917	2.8	*	5.6	53.9	11.6	31.9	19.5
1916	2.8	*	4.2	46.6	9.5	36.0	19.1
1915	2.9	*	4.5	45.1	7.2	33.1	16.8
1914	3.1	*	3.9	44.9	6.1	34.4	16.6
1913	3.0	*	4.1	46.5	5.2	41.0	15.7
1912	2.3	*	3.5	43.5	3.8	33.9	15.4
1911	3.2	*	3.0	44.3	2.3	41.5	19.6

*Not available.

†Standardized rates for ages 5 to 14.

‡These are "age specific" rates. Standardized rates not available at this time.

tonsillectomy as a general procedure will be settled until controlled groups, one group of those who have had their tonsils removed and the other of those who have not, have been studied statistically.

The steady decline in mortality in the industrial cases from 623.6 to 207.7 per 100,000 is comparable to the general decline that one would expect from studying

Chart I. This is the group which will be benefited most by the social legislation now being enacted. With the decrease of child labor that is now taking place, and the improvement in the social and economic situation of the industrial people in this country, we have a right to expect that these factors will be reflected in a much better mortality in the future.

The Prevention of Whooping Cough *

E. J. Huenekens, M.D.**
Minneapolis, Minn.

MODERN medicine is stressing more and more the prevention of disease. This is especially true of diseases of infancy and childhood, including the so-called contagious diseases. Physicians are gradually adapting themselves to the idea that the family doctor has other functions besides taking care of the sick; though one still hears an occasional old-fashioned doctor query, "Why vaccinate against small pox or inoculate against diphtheria when there is no epidemic?"

Well established procedures in the prevention of contagious diseases, are vaccination against small pox, the use of toxoid to prevent diphtheria, and vaccine to prevent typhoid. Two comparatively new procedures are clamoring for consideration, the administration of scarlet toxin to prevent scarlet fever and pertussis vaccine for whooping cough.

Pertussis vaccine has been in use for a number of years and its efficacy has been confirmed both by laboratory experiments and clinical evidence. Huenekens¹ was able to demonstrate that pertussis vaccine produces immune bodies, as shown by the complement fixation test; freshly prepared vaccine was the most effective. Later Mishulow, Oldenbusch, and Scholl² showed that old pertussis vaccine, properly prepared, preserved, and stored, retains its potency for several years. Unfortunately, their work is not wholly conclusive because it was performed on rabbits and not on human beings.

It has been contended that pertussis vaccine would protect against only one strain of the Bordet-Gengou bacillus, but Leslie and Gardner³ present evidence that the pertussis bacillus is a uniform species without fixed types.

The most favorable and best controlled clinical observations come from Madsen⁴, who reports two epidemics in the Faroe Islands. The isolated position of these islands cause the whooping-cough epidemics to appear in waves, separated by quite long intervals entirely free from whooping cough. In the 1923-1924 epidemic, 2,094 individuals were vaccinated, and 627 received no vaccine. The prophylactic effect of the vaccine was practically nil, but the mortality in the non-vaccinated group was twelve times that in the vaccinated,

and the disease in the latter group was much milder and of shorter duration.

In a second epidemic in 1929, the results were more striking. Of the 1,832 vaccinated individuals, 458 did not contract the disease, and only one died; while of the 446 nonvaccinated, only eight escaped pertussis, and eight died. The mortality was thirty times greater in the nonvaccinated group, and there were sixteen times as many severe cases.

TABLE I
Madsen's Analysis of 1929 Epidemic

	1,832 Vaccinated	446 Nonvaccinated
Not attacked	458	8
Mild cases	1,336	225
Moderate cases	29	170
Severe cases	8	35
Fatal cases	1	8

The vaccine used was from the State Serum Institute in Copenhagen, where it is always made from several recently cultivated strains of Bordet-Gengou bacilli; forty-eight-hour blood agar cultures are emulsified in physiologic salt solution containing 1 per cent formaldehyde and numbering ten billion bacilli per cubic centimeter.

According to Madsen, the favorable results were due to the following facts:

1. The vaccine was made from young strains.
2. The dose was rather large, twenty-two billion bacteria.
3. The vaccination was completed shortly before the onset of the epidemic; *i. e.*, at a time when the titer of antibodies produced by the vaccine is highest.

If we had no other evidence, these reports of Madsen would justify the use of pertussis vaccine, partly to prevent the disease, but especially to reduce the mortality of pertussis and to decrease its severity.

Favorable as is this report it does not solve the problem of permanent immunization. We must give credit to Sauer⁵ not only for being the first to attempt this but also for his apparent success. He prepares his vaccine largely according to the Danish State Serum Institute specifications, the principal difference being that he uses human blood for his blood agar culture plates. His technique follows: 8 cc. of bacillus pertussis vaccine

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**Clinical Professor of Pediatrics, University of Minnesota.

(1 cc. equals 10 billion bacteria) made from recently isolated, strongly hemolytic strains grown on Bordet-Gengou medium made with freshly defibrinated human blood, is injected subcutaneously in three weekly (bilateral) doses of 1 cc., 1.5 cc. and 1.5 cc. respectively. The reactions to this procedure are comparatively mild: an occasional rise in temperature, temporary local reactions (redness, induration and tenderness) and subcutaneous nodules which may persist for a few weeks at the site of each injection. Since we have no test of immunity in pertussis comparable to the Schick and Dick test, the efficacy of this procedure must be judged entirely by the clinical results.

In a recent round table discussion on the prophylaxis and treatment of whooping cough⁶ the latest and most comprehensive figures are available. Sauer reported on a total of 2474 cases. (See Table II.)

TABLE II
Immunization With Authorized Commercial Vaccine

	Injected	Exposed	Failed	
Evanston Health Department (1933)	865	68	16 familial 52 outside	4
Private patients (1932)	627	77	35 familial 42 outside	6
Three orphanages (1932)	252	57		6
"Cradle" infants under 2 mo. (1932-33) 6 cc.	400	15	8 familial 7 outside	6
(1934) 6 cc.	330	2		0
	2,474	219		22

Of 219 children definitely exposed to pertussis, 22 or approximately 10% contracted the disease. Kendrick of the Michigan Department of Health gave the preliminary figures of a three year study of the value of pertussis vaccine in the prevention of whooping cough. (See Table III.)

Kendrick used approximately the dosage advised by Sauer but her vaccine was not made from media enriched by human blood but more according to the method originated by Madsen. This Michigan study showed that 12.7% of the vaccine-injected group developed pertussis while 74.5% of control group developed the disease.

The report on Krueger's Pertussis U.B.A. (Commer-

cial) disclosed that, of 119 vaccinated children 53 or approximately 45% developed pertussis. On the basis of these figures it would seem less effective in prophylaxis than either Sauer's or Madsen's vaccine.

There has been a tendency during the past year to encourage the distinction that Sauer's vaccine is especially adapted for prophylaxis while Krueger's vaccine is more effective in therapy. It would seem that the vaccine which is finally judged to be more effective in prophylaxis should also be better therapeutically and *vice versa*.

Sauer advocates that during the four-month period while the child is developing his active immunity no other immunizations should be administered. One could imagine that a severe case of measles or scarlet fever with high temperature and prostration might interfere with the production of immunity by pertussis vaccine. But that the slow non-incapacitating immunization by diphtheria toxoid or pertussis vaccine should interfere with each other is rather a strain on our credulity and contrary to our experience with other immunological processes.

Summary

It may be said that while the final word on the value of pertussis vaccine in prophylaxis must await the passage of time, we have now enough evidence of its value to recommend it to our patients as a safe procedure of sufficient value to warrant an extensive clinical trial.

Either Sauer's or Madsen's vaccine should be given weekly in doses of 2 cc., 3 cc. and 3 cc. ($\frac{1}{2}$ in each arm.) The reactions are comparatively mild. Ten per cent of children thus immunized may contract whooping cough in a mild form when exposed to the disease compared to 75% of nonvaccinated children.

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TABLE III
Whooping Cough Prevention Study
Total in Study April 15, 1936—2,285
Exposures and Cases in Study Series to Date, April 15, 1936

Kind of Exposure History	VACCINE-INJECTED GROUP			CONTROL GROUP			TOTALS		
	Exposed		Cases	Exposed		Cases	Exposed		Cases
	Number		% of Exposed	Number		% of Exposed	Number		% of Exposed
Definite	60	9	15.0	72	58	80.5	132	67	50.75
Indefinite	55	3	5.5	51	27	52.9	106	30	28.30
None	3	3		26	26		29	29	
Totals	118	15	12.7	149	111	74.5	267	126	47.2
Per Cent of Total Cases			11.9			88.1			100.0

Growing Feet*

Edward T. Evans, M.D.**

Minneapolis, Minn.

A CONSIDERATION of the growing foot requires an understanding of the fundamentals of development, namely hereditary, embryonic, and early life factors. The foot you possess in adult life is, excepting extraneous influence, the foot you were born with and a reflection of maternal or paternal heritage.

Hereditary Factors

One may quite frequently use the designation, "type foot." By this we mean a foot, which at first glance, obviously falls into one of several categories. We all recognize the so called "peasant" type of foot, also commonly known as the German or Scandinavian type of foot. This is notoriously rather broad-heeled with a tendency to some flattening of the long arch, moderate pronation, and broad anterior arch with a considerable amount of subcutaneous fat and fibrous tissue-padding. Another common type of foot is the thin, relatively small, finely molded "aristocratic" type commonly met with in the petite French. The negroid foot is a classical example of a type foot, in that it is a long foot with a narrow heel but unusually flat longitudinal arch with considerable pronation through the anterior tarsal area and with a broad anterior arch, not, however, possessed of much subcutaneous fat or padding.

All gradations of these extremes, of what might almost be termed "pathological" types, may be met with.

Of course the ideal type of foot, at least, as ideal as the human foot may be, is one exemplified by a reasonably good longitudinal arch, narrow, well-molded heel, and anterior arch sufficiently broad for good support, but well-padded though not inclined to chubbiness.

In a paper as short as this, it is impossible to consider all the features of the foot. Basically, the human foot is not an excellent weight-bearing organ, although it has adapted itself well to the environment in the process of evolution. There is a tendency in many feet to carry over attributes of the primitive prehensile organ. Notable among these tendencies is the frequency with which we encounter a short first metatarsal, the so-called *metatarsus atavicus*, which may in later life prove a disturbing factor in proper weight-bearing and lead to the development of anterior metatarsal disorders and *hallux valgus*.

Suffice to say that one must appreciate the fact that the type of foot is hereditary, and treatment of its disorders must take cognizance of this fact lest one be too optimistic in prognosis and relief.

In addition to the hereditary qualities of the type foot, one should, of course, mention the congenital trait

*Prepared expressly for the special Pediatric issue of THE JOURNAL-LANCET.

**Assistant Professor of Orthopedic Surgery, University of Minnesota.

in the clubfoot case. I have in mind the case record in which a maternal grand-aunt had bilateral extreme clubfoot, and the present generation has only a very mild adduction deformity of the forefoot, but very definitely a congenital deformity requiring radical procedure for its correction.

Embryonic and Foetal Features

Clubfoot has been mentioned above. This is, of course, a congenital deformity and a subject by itself which will not be discussed in this paper.

The foetal position of the child may result in the development of an apparent deformity noted at birth. This must be carefully analyzed to rule out true congenital deformity, but a careful examination of the foot as a whole, irrespective of its apparent deformity will usually convince one of the fact that prolonged maintenance of a fixed position *in utero* has caused the condition. Treatment should be directed to the correction of the position by careful and easy manipulation over a period of time, stretching out the contracted tissues and allowing the previously stretched-out tissues to regain their tone and activity. This is an acquired, not a congenital, deformity.

The presence of a spina bifida, even an occult spina bifida, associated with a paralysis of the extensor and everting mechanism of the foot so that a paralytic clubfoot results must not be overlooked. Treatment here, with the exception of treatment of spina bifida, is directed to maintenance of normal position, the prevention of increasing deformity, and in later years, stabilizing procedures to maintain a fixed functional position.

The Baby's Foot

For the most part, the normal baby's foot at birth falls into two types; either a long thin type of foot in the baby of long bones without much fatty tissue, or the short, chubby type of foot so frequently seen with the chubby type of infant. It is frequently impossible to determine at birth whether the foot possesses maternal or paternal characteristics.

Assuming that the child will grow to early childhood without rickets or other debilitating disease affecting the development of the bony structure or normal soft tissue support, the child's foot will develop almost willy-nilly along hereditary lines.

Early weight-bearing is not to be frowned upon providing that weight-bearing is not productive of excessive stress or strain. At first weight-bearing, almost every infant's foot presents considerable pronation, but it is only by active use that the tone of the supporting structures can be developed.

In this respect, it is a common observation that the child will toe in, thereby assuming a position of maxi-

imum support. Frequently the parent will consult her physician because her baby is pigeon-toed. Most of these children are assuming a sensible position which gives them maximum support, because otherwise there would be considerable strain as a result of the weight-bearing line falling internal to the longitudinal arch. As long as the child persists in walking pigeon-toed, the probabilities are that no active treatment at that time is indicated.

One must appreciate the fact that the bony structure in the infant's foot is not firm until the child is about twelve years of age, and that it will develop normally along hereditary lines if given the opportunity, providing there are no extraneous factors operating. The indiscriminate use of firm supports, especially steel arches, should be frowned upon for several reasons. In the first place, treatment should be directed toward the maintenance of proper stance and the development of proper soft tissue tone through exercise and training. In the second place, the indiscriminate use of firm supports, while it may apparently mold the foot into proper shape, tends to weaken the soft tissue supports and make the patient dependent forever upon artificial support. In the third place, heavy supports inhibit the child's activity and prohibit the normal development of the child in physical activity with other youngsters.

It seems to me that there has been altogether too much tendency on the part of attending physicians to cater to the mother's desires for a shapely foot at the expense of the normal development of the foot. This is especially true when the mother appreciates the fact that the child's foot possesses either maternal or paternal characteristics, not disabling, which she would like to eradicate. The sacrifice of the child's normal development to this bit of vanity, should be frowned upon. One might as well take the infant and perform a surgical operation upon its nose in an effort to eradicate the type of nose with which it was born.

Parents should be instructed that their child has a type of foot and that it should be allowed to develop normally with attention to the development of soft tissue support rather than shapeliness, providing of course, that this or that particular type of foot will be adequate to future use as it develops.

The Pathological Longitudinal Arch

As a result of rickets or debilitating disease, an otherwise normal foot may have so lost the tone of its supporting soft tissue that artificial support is necessary for its rehabilitation, lest serious developmental changes occur. I have in mind a case of a young boy of three and one-half years who, though he developed his ability to walk normally prior to a severe pneumonia, subsequent to his pneumonia found great difficulty in walking and continually complained of pain in his feet. Examination in relaxation showed a perfectly normal contour of the foot with all the potentialities of proper weight-bearing. On weight-bearing, however, marked pronation occurred and it was almost impossible for the youngster actively to invert his foot. It was obvious that

at his age exercise alone would be insufficient. He was fitted with steel arch supports and wedged heels which held the feet in proper weight-bearing position and allowed him to actively exercise his feet in this position. As soon as complete maintenance of position is possible, these supports will be gradually discarded. But it is only in this type of case that arch supports should be applied to an otherwise normal foot.

There are, of course, those cases which early in life show the hereditary characteristics of a severe flatfoot. The parent may bring this child in with the request that something be done to prevent, if possible, the development of a foot such as he or she has suffered with. When the parent gives a history of this type of foot being inadequate, then and then only is one justified in attempting treatment to prevent a like experience in the child. I do not believe that the type of foot can be changed, but I do believe that a carefully supervised course of treatment over a period of years may so develop the supporting structures of the foot that it is not subjected to damaging stress and strain with resulting discomfort.

Such a course of treatment in the extreme case may combine the use of wedged heels, built up longitudinal arches, preferably flexible, and the institution of simple exercises which are not too complicated for the child to carry on. Such exercises should, if possible, be made a matter of play in the very young, and a matter of discipline in the older child so that eventually the maintenance of proper stance becomes a matter of habit.

There are some cases of flatfoot which are so extreme that they are resistant to exercise treatment. In this condition steel arch supports may prove necessary, but their use should always be accompanied by exercise, because all too often the discarding of steel arches later in life results in a resumption of the hereditary position. In some of these cases, it early becomes obvious that the treatment has little if any effect. In these, rare indeed, operative methods of correction may prove necessary. The large number of operations proposed for this type of severe flatfoot indicates that the success of the operative procedure is questionable. Transposition of the posterior tibial insertion, together with stabilization of the internal aspect of the tarsus, has proved the most reliable procedure. The operative procedures vary, however, from section of the os calcis to change the weight-bearing line, to radical sub-astragalar arthrodesis with wedge resections of the tarsal and anterior tarsal areas. Such operative procedures obviously result in rigidity of the foot though they may improve the weight-bearing line and give good functional results. Their use is, as stated, rarely indicated and only after all conservative treatment has been exhausted.

When a severe flatfoot is painful it may react by the development of spasm of the everting mechanism of the foot and the extensor mechanism of the toes, and be accompanied by secondary joint changes, all of which result in the development of a rigid, spastic, flatfoot. This type of foot may be seen during early adolescence, although it occurs more commonly in early adult life.

Its presence requires immediate active treatment consisting of manipulation of the foot under general anesthesia into an overcorrected position and fixation of the foot in plaster in this position until the contracted tissues have stretched out and the previously stretched-out tissues have had an opportunity to resume their normal tone and pain has subsided. The after-treatment consists in the maintenance of normal position by means of rigid arch supports and the utilization of active physiotherapy to restore the supporting mechanism of the foot. It is this type of case which, because of the marked contractions, occasionally requires peroneal section in order to effect correction.

It is our belief at the University Clinic that a short tendon Achilles is a female characteristic which may be apparent in the very early years of life. Certain it is that we frequently find young girls of eight, nine, or ten years with a tendency to pronation so marked that they stand with their feet turned outward at right angles to each other. These cases invariably present a limitation of dorsiflexion of the ankle when the foot is held in the mid position. And any attempt to have the child walk "Indian fashion" with its toes straight ahead causes poor general posture and strain of the calf muscles. We have shocked many a mother by suggesting that she fit her nine or ten year-old child to oxfords with Cuban heels, but it is our experience that this frequently corrects the condition, much to the delight of the child. Apropos of this belief, we are of the opinion that high heels are worn by women, not as a matter of style for satisfaction of their vanity, but rather as a matter of comfort demanded by this female characteristic.

One is frequently asked to express an opinion on the presence of an abnormal protuberance over the inner aspect of the longitudinal arch. This is usually caused by an accessory scaphoid which, though it is unsightly, seldom needs active treatment in the child unless other conditions of the foot indicate active treatment. After the bony development of the foot is complete, this enlargement may be cut down if demanded although at that age the child has usually adjusted itself to the condition and the mother is no longer so desirous of its removal.

X-ray examination of the foot in the young adolescent complaining of pain in the longitudinal arch may reveal the presence of osteochondritis of the scaphoid bone, more commonly called Köhler's disease. This may require, in an aggravated case, the wearing of a plaster boot until the acute process subsides.

X-rays may also reveal the presence of a destructive lesion of the accessory scaphoid similar to an epiphysitis which should perhaps more properly be called an apophysitis similar to that process involving the posterior tip of the os calcis which is known as apophysitis. Prevention of abnormal pressure over a period of time results in eventual cure in all cases, although some deformity of the bone structure itself may persist.

Pathological Conditions of the Forefoot Including the Metatarsal Arch

Web toes are a common congenital anomaly which call for no treatment providing the deformity is not extreme, unless plastic surgery is demanded for cosmetic reasons. X-rays should always be taken prior to surgery to determine whether or not complete bony structure is present upon the basis of which a good functional end result might be expected. One frequently finds marked abnormalities of the bony structure which would vitiate a good surgical result. Hammer toe is another common condition. This may occasionally be overcome by allowing the child to go barefoot for a summer with strict attention to the active correction of the toes at each step. Otherwise surgical correction of the deformity is indicated after bony development is complete if the condition is troublesome. Early procedures in this type of case are not attended with happy results because of the persistence of the tendency to deformity.

Before considering the anterior metatarsal conditions, may I disillusion you of the common conception that there is an anterior arch at the *heads* of the metatarsals. The arch is formed by the bony configuration of the *shafts* of the metatarsal but a section taken through the heads of the metatarsals will show that they lie in the same plane. Most so called anterior arch difficulties result from conditions which alter the supporting mechanism of the anterior foot and destroy its "gripping power." At each step the normal foot simulates the normal plantar reflex and assumes, to some extent, a gripping position. States of malnutrition, localized painful lesions, and other factors may result in weakness or atrophy of this supporting mechanism so that sustained effort of the forefoot is diminished and strain is thrown upon the ligaments or metatarsal heads. The anterior arch does not fall, it broadens. This is particularly true in that type of foot associated with the short first metatarsal mentioned above. Here, the head of the first metatarsal, by reason of its abnormal position, does not bear its normal share of weight-bearing and an abnormal amount of weight bearing is thrown upon the heads of the second and third metatarsals. Mechanical support of the forefoot, utilizing especially added support just behind the head of the first metatarsal, is productive of almost immediate relief. The shoes should have firm soles to make the internal supports effective. If the condition is allowed to persist, painful contraction of the extensors of the toes associated with flexion of the distal phalanges and the development of irritated areas and callouses and corns, is not unusual. Treatment should, therefore, be directed to support of the area together with development of the supporting soft tissue mechanism of the foot. The common exercises of picking up marbles, walking in sand, *etc.*, are of value.

Shoes

It would seem almost unnecessary to have to go into the question of shoes in a paper of this type and yet our patients frequently ask us what the proper type of shoe for a growing child should be. In my opinion,

unless specifically indicated, the use of a sensible, well-fitting shoe with adequate toe space and adequate length is all that is necessary. The shoes should, of course, be reasonably flexible to allow proper exercise of the foot in walking. It should fit well enough so that no friction occurs, resulting in excoriation or blisters. They need not be expensive or fancy.

For the child who has a tendency to flatfoot, there are many shoes on the market which have a slightly wedged heel and built-in longitudinal arch which gives support without sacrificing muscular development. I should again like to mention that rather frequently you may find it wise to place an adolescent girl in Cuban or military heel shoes.

It is almost impossible for any mother to take her child into the average shoe store without obtaining all sorts of advice as to how her child's feet should develop. And almost never do these commercial houses fail to attempt to sell some type of corrective apparatus with-

out any conception of the normal development of the child's foot. It would seem their sole purpose is the advancement of their sales without regard to the true needs of the child. The lay public should be warned that the assumption of a medical or orthopaedic-sounding name as a trade mark is not a certification of the value of the article by the profession.

Conclusions

1. An understanding of the normal hereditary and developmental factors is necessary for proper consideration of the child's foot.

2. Artificial means of support should never be used unless it is obvious that functional development of the foot cannot be accomplished.

3. Certain pathological states should be recognized and treated accordingly during the developmental age of the foot.

State Medicine in Minnesota

C. B. Young, M.D.

J. Arthur Myers, M.D.*

Minneapolis, Minn.

FOR many years we have been reading much about state medicine. At first we heard the older practitioners sadly prophesying the doom of the private physician. Next, professional social workers began advancing plans and schemes whereby the state would simply take over the practice of medicine and every physician would be reduced to the status of a state employee. Now, high school students and various lay organizations are earnestly debating the subject, and many people seem to be confirmed in the belief that the millenium is here and that they have only "to ask and they shall receive." However, when asked who is to pay for this medical service they vaguely reply, "The Government." The purpose of this paper is to point out dispassionately and fairly just what the various governmental units are already paying toward medical care for the people of Minnesota; and to determine, if possible, just how much and where governmental medicine has increased during the past ten years. It is obvious that state medicine is not coming; it is already here, and has been here for more than seventy years. The government has long accepted the responsibility for the care of the indigent, the insane, the deaf, the blind, the feeble-minded, and within the last thirty years, the epileptic and tuberculous. The criteria for eligibility to free medical care by the government's institutions have always been, first, defectives and persons who are a menace to the health and welfare of organized society, and second, indigents and persons of the very lowest income levels. These criteria are still prevalent in state and county

institutions but have been almost entirely disregarded by federal institutions. A possible explanation for this is the very excellent Veteran's Lobby that has been maintained in Washington for the past sixteen years.

In Minnesota we have four governmental units actively engaged in the practice of medicine, *i. e.*: federal, state, county, and city. The federal government by congressional action¹ has assumed the care of disabled veterans regardless of their financial condition. The total cost of maintaining the two Veterans Hospitals² in this state increased from \$790,391 in 1925 to \$1,194,728 in 1935, an increase of 51%. The sum allocated for medical care is less than ten per cent of the total amount—\$13,697,934³—spent for benefits to veterans of all wars for medical care, compensation, insurance and pensions in 1935. The federal government also provides medical care for the Indians⁴ in this state, and the total cost of this service was \$55,000 in 1925 and \$209,000 in 1935, an increase of 280%. The Indian population⁵ of Minnesota increased from 14,300 in 1925 to 15,283 in 1935, an increase of almost seven per cent. In August, 1935, an infirmary with a capacity of 117 beds for the care and treatment of tuberculous Indians was opened at Ah-gwah-ching⁶. This building is maintained by the State Sanatorium and the federal government reimburses the State at the rate of two dollars per day for each patient.

In 1933, by establishing the Civilian Conservation Corps, the federal government assumed the cost of medical services for approximately ten thousand additional persons in our state. These civilians were provided with medical and hospital service totaling about \$490,000⁷

*Professor of Preventive Medicine, University of Minnesota.

for the fiscal year ending June 30, 1936. This figure is based on the number of camps in Minnesota and the total expenditures for medical purposes in the entire Civilian Conservation Corps.

The Federal Transient Division was established in November, 1933, and continued for about two and a half years when it was disbanded and the camps converted into WPA⁸² work camps. The Transient Division provided complete medical and dental care for the homeless, including dentures, glasses, trusses, *etc.* The total cost of medical service provided by the Transient Division⁸ in Minnesota was \$52,769 in 1934, and for the year 1935, \$95,207. Under WPA⁹ regulations workmen are given treatment for injuries incurred while on duty only, and this treatment is provided by private physicians who are paid on a fee-basis from WPA funds.

In 1863, the Minnesota State Legislature authorized¹⁰ the Governor to place, not to exceed twenty-five, indigent insane in the Iowa State Hospital. Three years later, the Legislature¹¹ appropriated a sum of money to establish a hospital for the insane, and the first institution of its kind in Minnesota was opened in an old hotel building at St. Peter the same year. Gradually, as the state grew to maturity, more institutions were built until now, we have three hospitals and three asylums for the care and treatment of the insane. At the present time, contracts have been let for another hospital at Moose Lake and it is expected to be completed within the next two years. Each of these institutions has a full time resident medical staff plus a consulting staff of private physicians who donate their services.

The average number of patients in insane hospitals and asylums for the year ending June 30, 1936, was 9,544 and the total expenditures were \$2,088,787¹². Ten years ago, 7,197 insane persons were hospitalized at a total cost of \$1,802,294¹³. During the ten year period the average number of insane persons in institutions increased 32.6%, but the cost increased only 15.9%. Minnesota's population¹⁴ increased 5.8% over the same period. For the fiscal year 1926, 25.8% of the patients were classed as pay and part-pay and contributed 11.3%¹⁵ of the total maintenance costs. A decade later, 21.7% of the patients paid 7½%¹⁶ of the total expenditures. In other words, the care of the insane was 88.7% socialized in 1926, and 92.5% in 1936. It seems reasonable to conclude from the above figures that the care of the insane is slowly approaching complete socialization, and that the total number of insane persons in the state institutions is increasing much more rapidly than the rate of normal population increase.

Although the care of the deaf, the blind, and the feeble-minded is more educational than medical, the underlying causes of the conditions are in most cases of a medical nature. It is interesting to note that the first legislation authorizing¹⁷ the hospitalization and education of defectives was in 1858, the same year that Minnesota was admitted to the Union. However, it was not until five years later that the Minnesota Institution for

the Education of the Deaf and Dumb was opened at Faribault with eight pupils in attendance. Growth has been rather slow and for the fiscal year 1926, the average attendance was 261. The total maintenance cost for the year was \$151,112¹⁸. Ten years later, the average attendance was 314—an increase of 20%—but the total expenditures were \$164,739¹⁹—an increase of only 9%. Minnesota law²⁰ requires that deaf or dumb children between the ages of six and twenty years attend the state school or an equivalent private school until discharged by the superintendent with the approval of the State Board of Control. The state school is entirely free except for postage, clothing, and transportation.

In 1864²¹, the name of the Faribault school was changed to the Minnesota Institution for the Deaf, Dumb, and Blind; and the first class of blind was admitted in 1866. The school²² for the blind is free to all children who are unable to attend public schools because of defective vision. In 1926, with ninety-nine students in attendance during the school year, the total maintenance costs were \$106,814²³. A decade later, 126 students attended the school, but the total costs had decreased to \$93,915²⁴. The Division of the Blind also provides relief, higher education and assistance in finding work to the needy blind. During the past decade the relief needs of the blind have greatly increased, and the total amount spent for relief and education of the blind increased from \$147,234²⁵ in 1926, to \$204,458²⁴ in 1936, an increase of 38.8%. The 1935 Legislature²⁵ appropriated approximately \$125,000, to match an equal grant by the Social Security Board, for the care and rehabilitation of the blind. However, the Division of the Blind has not received the federal grant because the Minnesota Law does not conform to federal requirements. The law will probably be amended at the 1937 session of the State Legislature.

In 1879, the Legislature authorized²⁶ a further expansion of the Faribault school and a department for the care of the feeble-minded was organized on an experimental basis. Two years later²⁷, it was made a regular division of the school and money was appropriated for a separate building. The School for the Feeble-minded and Colony for Epileptics, as it is now called, has grown rapidly and is now the largest state institution with an average population of 2,312 for the fiscal year 1936. The total expenditures for that year were \$529,648²⁸, as compared with \$607,944²⁹ a decade before, a decrease of 12.8%. Until 1925, the epileptics were cared for at Faribault, but in that year a colony for epileptics was opened at Cambridge. It is the state's newest institution and its growth has been very rapid, but there are still more applications than vacancies. The total expenditures for the fiscal year 1926, were \$35,768³⁰, but ten years later, they were \$207,734³¹, an increase of 483%. However, this does not give a true idea of the actual increase in the cost of caring for the epileptics because in 1926, the colony at Cambridge was just getting started and most of the epileptics were still being cared for at Faribault. Combined expenditures for the two institutions increased

about fourteen per cent for the decade and the average number of feeble-minded and epileptic in both institutions increased from 2,013 in 1926, to 3,185 in 1936, an increase of 58%.

Minnesota has the honor and distinction of being the first state in the Union to provide state funds for the hospitalization of indigent crippled children. In 1897, the Legislature appropriated \$5,000³² to be used to hospitalize indigent crippled children in the City and County Hospital at St. Paul. Ten years later, the Gillette State Hospital for crippled children was authorized³³, but it was not opened until 1911. The medical staff is composed of the foremost orthopedic surgeons and specialists of the Twin Cities who all donate their services. Total maintenance costs were \$223,563³⁴ for the fiscal year 1926, and \$224,740³⁵ a decade later and the average hospital population was 233 in 1926, and 240 in 1936. In addition, \$44,088³⁶ was utilized by the Department of Education to provide vocational training for physically handicapped children for the fiscal year 1926, and \$51,139³⁷ for the fiscal year 1936. By provision of the Social Security Act of 1935³⁸, an annual sum of approximately fifty thousand dollars was granted to Minnesota for the care of crippled children, particularly those from rural and economically distressed areas. By action of the State Board of Control the Division of Crippled Children was created to locate and keep permanent records of all crippled children in the state. The director of the division also assumes leadership in conducting twelve orthopedic diagnostic clinics a year at various cities in the state to examine and arrange hospitalization for needy children in that locality. These clinics are held in coöperation with the local medical societies or other interested welfare organizations. Five public health nurses and two physio-therapy nurses have been secured to do the follow-up work and to assist in conducting these clinics.

It should be emphasized that there has been no change in eligibility requirements and this program can in no way be construed as an invasion of the private practice of medicine. It has resulted in a marked reduction of heretofore long waiting lists and therefore provides better and more satisfactory service to the indigent crippled child.

Minnesota by organizing a State Department of Health in 1872³⁹, was the third state on the Union to establish governmental health protection and regulation. The State Board of Health consists of nine members appointed by the governor for terms of three years each. The terms of three members expire each year, and all members serve without pay. This board by regular meetings and through its executive secretary, the state health officer, regulate and enforce the various health laws of the State. They may also draft reasonable regulations for the preservation of the public health, which, after being approved by the attorney general and duly published, have the authority of law.

In 1926, the total cost of the State Department of Health was \$205,675⁴⁰, a per capita cost of \$0.087.

Even this amount is not all chargeable to the taxpayers of this state, because the Federal Government contributed \$18,099 and miscellaneous collections of the department were \$13,493. Ten years later, the gross expenditures of the Health Department were \$321,415⁴¹, an increase of 56%. However, this increase is more apparent than real, because several State Departments have been transferred to the Health Department. The largest of these, the Division of Hotel Inspection, was formerly under the jurisdiction of the State Securities Commission. The expenses of this division, amounting to approximately thirty-five thousand dollars each year, cannot therefore be considered as an addition to the cost of state health. In 1933, laws⁴² regulating and licensing plumbers were passed by the Legislature and this new function was added to the administrative division of the Health Department. License and inspection fees more than pay the administrative cost of the new division. The stream pollution survey formerly was carried on by the conservation department. The federal government under terms of the Social Security Act granted Minnesota \$78,138⁴³ for the fiscal year 1936, to be used to extend and improve public health functions. This amount is only about half of the total amount possible under maximum provisions of the Act. It is apparent that, in spite of a gross increase in the Health Department budget, the actual expenditures of state money is about the same in 1936 as in 1926.

Perhaps the least known but certainly not the least important of our state health agencies is the Livestock Sanitary Board. This board, formed in 1903, is designed to eradicate diseases of livestock that directly or indirectly affect man. The chief problem has been, of course, tuberculosis in cattle. Exactly how much this work has contributed to our marked decrease in the tuberculosis death rate in man is difficult to say, but it must be considerable. Thousands of tuberculous cattle have been slaughtered, each of these being a potential dispenser of millions of tubercle bacilli. For the past two years, Minnesota has been an officially accredited area⁴⁴—this simply means that practically all herds in the state have been tested and the incidence of tuberculosis is less than .5%. Glanders in horses and rabies have also been practically eliminated through efforts of the Livestock Sanitary Board. In 1926, this board undertook plans to eliminate Bang's disease in cattle. Milk containing bacillus abortus is known to cause undulant fever in man and the only practical method of entirely eliminating this disease lies in completely eradicating it in cattle, swine, and goats. In 1934, the federal government, in cooperation with the Livestock Sanitary Board, began an extensive program to control Bang's disease. The work is progressing satisfactorily and before many years we may look forward to the complete elimination of Bang's disease. For the fiscal year 1926, the division operated on a budget of \$488,096⁴⁵, but a decade later the total expenditure was only \$153,533⁴⁶, a decrease of 68%. However, the federal government expended approximately \$226,000⁴⁷ for the fiscal year 1926, and \$1,174,215 for the fiscal year 1936, for these same pur-

poses. Total expenditures, therefore, increased 85.9%.

A state sanatorium for consumptives was authorized in 1903⁴⁸, but the institution was not opened until five years later. At the present time the State Sanatorium is a fine modern institution with a capacity of 480 beds including the Indian Infirmary which was opened in August, 1935. In addition to the tuberculous Indians in Minnesota, the State Sanatorium cares for patients from the forty-six unorganized counties and also supervises epidemiological work in these counties. The total maintenance cost for the fiscal year 1926 was \$194,816⁴⁹. A decade later, the total cost had increased \$194,816 to \$305,641⁵⁰. The approximate percentage distribution⁵¹ of income for the State Sanatorium for the year 1936 was as follows: counties 42%, Indian Bureau 18%, federal transients 1.15%, pay-patients 3%, the state 29%, and miscellaneous 5%. In addition to the state institution, we have fourteen county sanatoria⁵² with a bed capacity at the present time of 1,793, making a total of 2,073 beds available for the hospitalization of tuberculous persons. For the past two years there has been empty beds in almost every sanatorium in the state. However, if all our known methods of diagnosis were utilized to their maximum extent on every individual in the state, these beds would in all probability be more than filled. Although figures from all the county sanatoria are not available for the year 1925, the approximate total maintenance cost of the fourteen county sanatoria was \$1,253,000. The 1935 cost was \$1,341,975⁵³, an increase of about 7%. There has been, however, an increase of 82% in the amount of state aid paid these sanatoria during the same period. In 1925, the total state aid paid to county sanatoria was \$237,995⁵⁴, or about 19% of the aggregate maintenance costs. In 1935, \$436,097⁵⁵, or about 30% of the total expense was paid by the state. This shift in costs toward the state is due entirely to the increased number of free patients, because the state is obligated by law⁵⁶ to reimburse the county sanatoria at the rate of \$5 per week for each patient. Hilleboe⁵⁷ in his report to the Board of Control for the fiscal year 1936 makes the following pertinent statement: "The percentage distribution of income by sanatoria has changed considerably in the last five years. In 1931, 50.5% of the total income came from the sanatorium district and 16.4% came from state aid for resident cases. In 1935, 62% of the income came from the sanatorium district and 30% from state aid for resident cases. It is to be noted that the proportionate cost is shifting more and more to the county and to the state, and that the state particularly has had quite a marked increase in the cost of care of tuberculous individuals because of the fact that the patients are no longer able to pay for their care, or even to partially pay for their care in the majority of cases." We believe that it is safe to say that the care and treatment of tuberculosis in Minnesota is between 95 and 98 per cent socialized at the present time. It is probable that this represents an approximate maximum under existing laws and eligibility requirements. In 1925, 92.8%⁵⁸ of the Hennepin County health expense was for the Glen Lake Sanatorium and

13.4%⁵⁹ of the Minneapolis Health Department's budget was used for tuberculosis control work. Although the county portion of maintaining Glen Lake Sanatorium had increased 9% in 1935, the relative amount spent on tuberculosis in Hennepin County was only 83% of the total health budget. In Minneapolis, the Health Department expended 20.8%⁶⁰ of its budget on tuberculosis control work or nearly double the 1925 expenditure. Because of the marked increase in medical aid to indigents, only 29% of the total (city and county) health expenditures was for tuberculosis in 1935, as compared to 46% in 1925. The per capita cost of tuberculosis in Hennepin County was \$0.91 in 1925, and \$0.89 in 1935. No figures are available for the Ramsey County Sanatorium because it is a part of Ancker Hospital, but the Health Department in St. Paul expended 16.2%⁶¹ of its budget on tuberculosis control work in 1926 and 13.4%⁶² in 1935. In St. Louis County, 72%⁶³ of the county health expenditure was for the treatment and control of tuberculosis in 1925, but only 34%⁶⁴ in 1935. However, the per capita costs were \$0.87 in 1925, and \$0.95 in 1935. All of the above figures represent local costs only and therefore do not include state aid. The total cost of governmental control and treatment of tuberculosis in Minnesota was approximately one and a half million dollars in 1925, and \$1,690,000 in 1935. This represents a per capita cost of \$0.60 in 1925, and \$0.64 in 1935. These figures do not include the cost of caring for tuberculous individuals in the Veterans Hospital and in our state institutions for the insane, feeble-minded, epileptic, *etc.*, as that cost is a part of the regular maintenance expense of the institution.

University Hospital, now called the Minnesota General Hospital, has always been primarily a teaching institution. Its secondary purpose is to provide medical services to the indigent of our rural counties that have no local facilities. Prior to the depression, local physicians cared for the indigent in their own community and sent only unusual cases, and patients requiring surgery to the University. Gradually as the depression wore on, more and more patients were sent to the University. The hospital has been enlarged from a capacity of 155 in 1925 to 325 in 1935. In addition a large out-patient department cares for thousands of ambulant cases each year. The total operating costs of the University Hospital increased from \$230,590⁶⁵ for the fiscal year 1925, to \$606,225⁶⁶ for the fiscal year 1933, an increase of 163%. In 1925, claims totaling \$132,382 were filed, of which one half was paid by the counties and the other half from the state's general revenue fund. A decade later, claims totaling \$351,161 were filed, and \$340,580 collected. Some counties are delinquent in the payment of their share of the cost, so that actual payments in any one year may be more or less than the claims filed.

The direct responsibility for the care of the indigent sick rests upon the county commissioners in places where the county system is used, and upon the township's supervisors where that system exists. Of course, the commissioners may delegate the responsibility to special boards or commissions. City governments may also ac-

cept this responsibility, and it is usually delegated to a board of public welfare appointed by the mayor.

Locken⁶⁷ recently conducted a survey of all the counties of the state and found that twenty-six have established a fee-basis plan where all the physicians participate in the care of the indigent. The patient simply calls his own physician and the physician presents a bill to the county for services rendered. These twenty-six counties report the system working with reasonable satisfaction. Fifteen other counties use a fee-basis system, but it is unsatisfactory due to the fact that the township officers are notoriously difficult to reach for authorization. Eleven counties report that the county physician contract plan is in effect and that in nearly every case medical care is regarded as unsatisfactory by the local physicians. Eight counties have a combination of county physicians and fee-basis plan and four report satisfaction and four dissatisfaction. There are a few counties that have no provision at all for the medical care of indigents other than the University Hospital. At the present time there are about forty thousand families on direct relief and WPA⁶⁸, and about thirty-five thousand persons receiving old age pensions in the rural counties of the state. These people must be cared for when sick, and if the local physicians are not compensated by the county on a fee-basis, the physicians are duty bound to care for them *gratis*. When one out of every five or six families is on relief in a community, the burden upon the local physicians is unquestionably unfair. In 1935, physicians and dentists of the rural counties received \$917,521⁷⁰ from the State Emergency Relief Administration for medical care of relief clients. This method of providing medical care has been discontinued and the burden returned to the counties and other local units. The obvious solution is for all rural counties to adopt the fee-basis plan.

Urban counties, Hennepin, Ramsey, and St. Louis, have entirely different systems for the care of their indigent, and these systems have evolved through a process of adaption to local conditions, both geographic and political. The City of Minneapolis has maintained a City Hospital for almost thirty-five years. It is closely connected with the Medical School of the State University and three of its department heads are full time members of the Medical School faculty. Residencies are at a premium and thus it is possible, with the aid of a large visiting staff of physicians, to staff the entire hospital at almost no cost to the City. Ramsey County and the City of St. Paul have operated Ancker Hospital under a joint partnership plan since 1889. This institution is also used for teaching purposes and is staffed by physicians volunteering their services. St. Louis County is far from the Medical School and there is no real reason for a large centralized teaching institution, and therefore, relief clients are cared for in their own homes by private physicians who are paid by the county on a fee-basis. We shall attempt to compare the costs of medical care for the indigent in these three counties. The City of Minneapolis and rural Hennepin County have entirely separate arrangements for the care of in-

digent sick, but the care of the tuberculous and practically all the specialized welfare activities (except Public relief) are financed from county funds. We shall first discuss the health and welfare expenditures of Hennepin County⁷¹ in 1935 as compared to 1925.

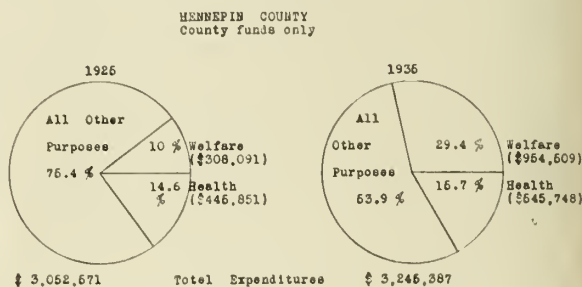


Fig. 1

The accompanying chart (Fig. 1) shows clearly that the 98% increase in the health and welfare budget is largely due to welfare expenditures (216% increase), and not to health expenditures (22% increase). Probably a more accurate comparison would be on a per capita basis. The population of Hennepin County increased approximately fifteen per cent during the ten-year period. The total health expenditures from county funds was \$0.95 per capita in the year 1925, and \$1.01 in 1935. In addition, the SERA paid private physicians and dentists a total of \$16,531⁷² for medical and dental services to relief clients of rural Hennepin County, as they are not eligible for care at Minneapolis General Hospital. There has been no new county health program started during the ten-year period. Welfare expenditures⁷³, however, increased from \$0.65 per capita in 1925, to \$1.76 per capita in 1935. Much of this increase is due to old age pensions and mothers' aid.

Before discussing the costs of health and welfare activities for the City of Minneapolis, we should like to call your attention to a few facts relating to the number of persons dependent upon government funds for their very existence. Ten years ago, the number of persons on relief was, at the most, about one thousand families per year. Each year following the memorable stock market crash, the relief load mounted higher and higher until in January, 1935, more than 24,000⁷⁴ cases were registered on the Minneapolis relief rolls. It is difficult to estimate the number of people dependent upon relief but it probably exceeded 100,000 or somewhat more than one-fifth of the total population of the City of Minneapolis. At the present time the relief rolls are greatly reduced, but when WPA⁷⁵ workers are added to the existing relief case load, we find that there are still about 20,000 families and single persons dependent upon government relief in one form or another. There are also about ten thousand persons receiving old age pensions. Thus we know that in spite of recovery there are still between eighty and ninety thousand persons in the City of Minneapolis that must receive free medical care and hospitalization in case of serious illness. How many

more families there are with incomes of less than \$1,000 per year we do not attempt to guess. The total amount spent for welfare (public relief) in the City of Minneapolis⁷⁶ for the year 1925 was \$570,968, a per capita cost of \$1.34. Ten years later, the amount had increased 1452% to the astonishing figure of \$8,863,681, a per capita cost of \$18.10.

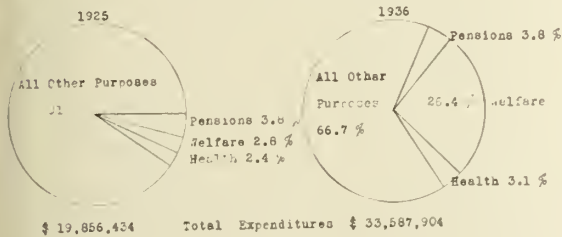
CITY OF MINNEAPOLIS
Federal, State & City Funds

FIG. II.

The accompanying diagram (Fig. II) shows graphically the tremendous increase of welfare expenditures in relation to the total city expenditures. We have not been concerned as to where the city gets its money, but it might be interesting to know that all except \$80,000 of the amount spent on public relief was either borrowed (bond issue) or received from state and federal relief agencies. The total amount⁷⁷ spent for health increased from \$486,399 (1.14 per capita) in 1925 to \$1,076,817 (\$2.19 per capita) in 1935, an increase of 121%. General Hospital⁷⁸ has borne almost the entire burden of caring for relief clients and its total maintenance cost has increased 268% from \$212,331 (\$0.50 per capita) in 1925, to \$781,197 (\$1.50 per capita) in 1935. Although General Hospital accounted for 72% of the total amount spent by the city government for health in 1935, the other 28% is perhaps more important to the average citizen, because he gets a definite amount of protection for his tax money. This is not the place to discuss the activities of the Health Department, but it suffices to say that Minneapolis rated 930 points out of a possible 1,000 in a survey conducted by the American Public Health Association and the United States Chamber of Commerce for the year 1934. The total cost of the Health Department⁷⁹ increased from \$122,871 in 1925, to \$146,996 in 1935, an increase of 19%. However, the city's population increased 15% and thus the per capita cost was twenty-nine cents in 1925 and thirty cents in 1935. Maintenance costs of Lymanhurst Health Center⁸⁰—under Health Department supervision—decreased 32%, a per capita reduction from eleven cents in 1925, to six cents in 1935. Part of the reason for this reduction is the fact that the personnel of the Cardiac Convalescent Hospital was furnished by ERA⁸¹ and WPA⁸² and thus labor costs are not included in the above figures.

There were fifty-nine school nurses and ten part time school physicians employed by the Minneapolis schools⁸³ at a total cost of \$103,475 for the year 1925, a per

capita cost of twenty-four cents. In 1935, fifty-nine nurses and twelve physicians were employed at a total cost of \$116,190, a per capita cost of twenty-four cents.

In addition to the amount spent by the city government for the various medical services, the community fund⁸⁴ expended \$146,108 for free clinics, nursing services and dental care of children in 1925, and \$192,257 in the year 1935, an increase of 31%. However, the relative proportion of the total fund spent for medical care was 15% in 1925, and 13% in 1935.

At the present time—January 1937—there are about fifteen thousand cases on WPA and direct relief and about four thousand persons receiving old age pensions in Ramsey County. Therefore, as in Hennepin County, approximately one-fifth of the total population of Ramsey County is receiving government relief in one form or another. Because the Ramsey County Board of Public Welfare⁸⁵ receives funds from both city and county as well as state and federal assistance, we have compared only health and welfare expenditures (Fig. III) in 1935 with similar expenditures in 1925. Expenditures for medical aid to the poor and care of the indigent tuberculous increased 69% during the ten-year period, from \$510,943 (\$1.91 per capita) in 1925, to \$865,700 (\$2.81 per capita) in 1935. This sum in 1935 included salary of five county physicians and approximately seventeen thousand dollars paid to private dentists on a fee-basis for dental care of relief clients.

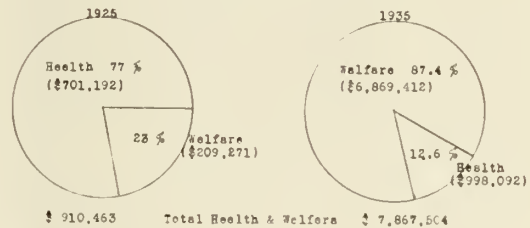
RAMSEY COUNTY & SAINT PAUL
Health & Welfare Expenditures
City, County, State & Federal Funds

FIG. III.

Welfare expenditures increased from \$209,271 (\$0.78 per capita) in 1925, to \$6,869,412 (\$22.35 per capita) in 1935, an increase of over three thousand per cent. Non-relief health expenditures decreased considerably during the same decade. The St. Paul Health Bureau⁸⁶ decreased expenses from \$141,622 (fifty-three cents per capita) in 1926, to only \$95,992 (thirty-one cents per capita) in 1935, a decrease of 39%. The school health⁸⁷ program also reduced expenditures from \$48,627 (eighteen cents per capita) in 1925, to \$34,404 (twelve cents per capita) in 1935, a decrease of 25%. In addition, the St. Paul Community Chest⁸⁸ classified \$72,545 as medical expenditures in 1925, and \$61,887 in 1935.

St. Louis County has approximately twelve thousand cases on WPA and direct relief and thirty-two hundred persons receiving old age pensions or somewhat more than one-fifth of the total population.

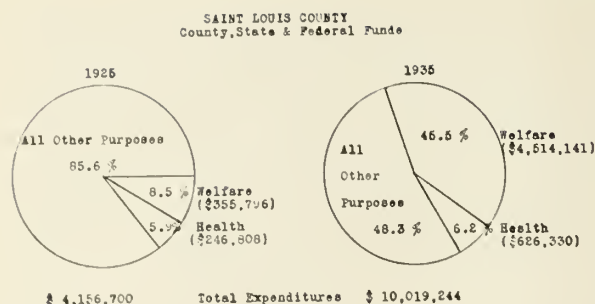


Fig. IV

Total health expenditures⁸⁹ (Fig. IV) increased 154% during the past decade from \$246,808 (\$1.21 per capita) in 1925, to \$626,330 (\$2.77 per capita) in 1935. These figures do not include school health because practically all of the range cities maintain their own school physician and dentist from local funds. Welfare expenditures⁹⁰ increased 1,169% from \$355,786 (\$1.73 per capita) in 1925, to \$4,514,141 (\$19.97 per capita) in 1935.

Summarizing⁹¹ health and welfare expenditures for the three urban counties, we find that Hennepin County spent \$1.98 per capita for health in 1925, and \$3.24 per capita in 1935. Ramsey County health expenditures totaled \$2.66 per capita in 1925, and \$3.24 per capita in 1935. Excluding school health, St. Louis County expended \$1.21 per capita in 1925 and \$2.77 per capita in 1935. Even allowing twenty-four cents per capita for school health (the Minneapolis cost) we find that the per capita cost of medical care in St. Louis County is still somewhat less than in Hennepin and Ramsey Counties. This fact would seem to indicate that the fee-basis method of providing medical care to relief clients is no more expensive than the centralized hospital system used in Minneapolis and St. Paul.

Welfare expenditures for Hennepin County were \$1.99 per capita in 1925, and \$19.86 per capita in 1935. Ramsey County spent \$0.78 per capita for direct relief in 1925, and \$22.35 per capita for direct and work relief in 1935. St. Louis County welfare expenditures were \$1.73 per capita in 1925, and \$19.97 in 1935. These per capita costs will all be still higher in 1936 and 1937 because of the increased cost of WPA and also because of liberalized old age pensions. These figures are all based on total expenditures for relief and work relief from county, state, and federal funds.

The above chart (Fig. V) gives comparative expenditures of the various governmental health units for the years 1926 and 1936. According to the report of the White House Committee on Costs of Medical Care⁹², the American people spend approximately four per cent of their total incomes each year for all forms of medical care. This figure remains fairly constant year after year in good times and bad. In 1926, the total value of goods and services⁹³ produced in Minnesota was slightly more than one and a half billion dollars. Four per cent of this amount is sixty million dollars or the approxi-

mate cost of all forms of medical care in our state. For the fiscal year 1926, government medical care in Minnesota totaled approximately seven million dollars or about eleven per cent of the aggregate sum. Ten years later, the value of goods and services produced was about one billion, one hundred million dollars⁹⁴ and nearly one-fifth of our total population was receiving government relief. On the above basis, the total cost of medical care in Minnesota would be approximately forty-four million dollars, of which about twelve and a half million, or twenty-eight per cent, was provided by the various governmental agencies and institutions. This shift is certainly significant if it is a permanent change in our method of providing medical care.

We have tried to point out as accurately and as fairly as possible the extent of state medicine in Minnesota at the present time as compared with a decade ago. Conclusions from these findings, whatever they may be, are most important only insofar as they relate to the future of organized medicine. There is no doubt that governmental responsibility for the medical care of a certain proportion of our people has increased tremendously during these past ten years. We believe, however, that this increase is fundamentally due to the distressing economic conditions that have prevailed in this state and nation for the past seven years. It depends largely upon one's personal economic views whether or not he believes that the present conditions are to be permanent or temporary. Almost everyone will agree that if unemployment could be completely eliminated, we would have no problem of socialized medicine. However, as long as from one-sixth to one-fifth of our total population remains dependent upon government relief in one form or another, they will demand and receive free medical care. How will that care be given in the future? Probably about the same as it is now, with perhaps some increase in the use of the fee-basis plan for indigent care, especially in the rural counties.

While the underlying principles of professional relationship to the community have scarcely changed at all during the last decade, organized medicine itself has made some progress toward better medical care for all, whether rich or poor. Perhaps the most significant is the development of the community health center, of which Lymanhurst Health Center in Minneapolis is an excellent example. The movement is still in its embryonic stage, there being only one in Minnesota, but there are several in other states. These centers are primarily interested in diagnosis and preventive medicine, such as Mantoux testing, vaccination and inoculation, etc. At present, they function largely as tuberculosis control centers, but are beginning to include control of venereal diseases and preventable heart diseases in children. These centers are staffed by leading private physicians who serve gratuitously. This plan is generally approved by organized medicine and by the United States Public Health Service. Some believe that these centers are the opening wedge for complete socialization of medicine. Whether they are or not depends entirely upon organized medicine itself. Under present conditions of man-

TOTAL MEDICAL EXPENDITURES
MINNESOTA - IN THOUSANDS OF DOLLARS

FISCAL YEAR 1926 CALENDAR YEAR 1926 FISCAL YEAR 1936 CALENDAR YEAR 1936

* FISCAL YEAR 1925 - 1936

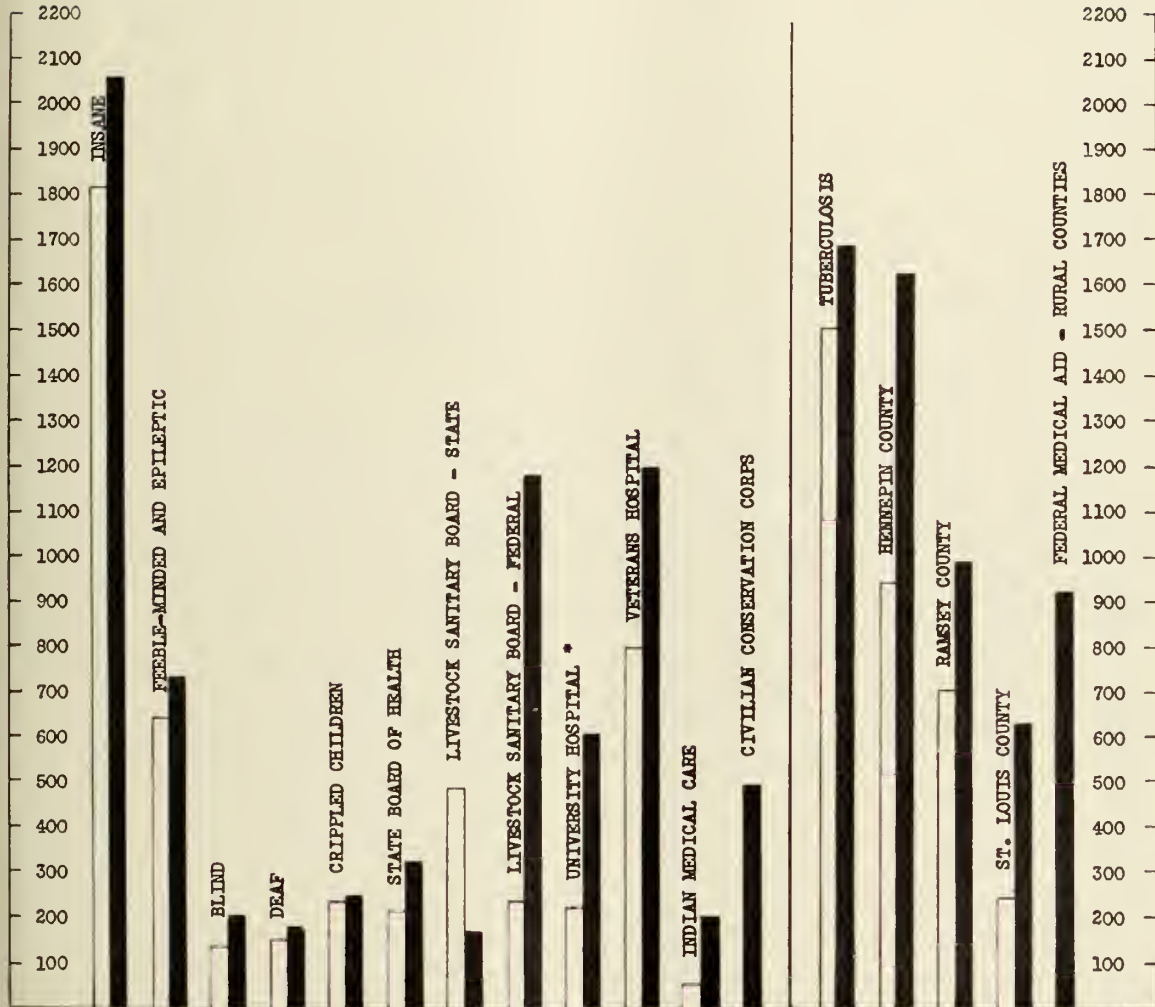


FIGURE V

agement and control, we do not believe there is any such danger. It is quite possible that these centers will some day be the center of medical knowledge in the community, serving not only the indigent population but the medical profession as well. Such a center, with the cooperation of the physicians of the district could be made a very effective educational aid in any community, urban or rural.

Another significant development of the past few years is hospital insurance. For a small monthly sum the

individual may protect himself from hospital bills to the extent of twenty-one free hospital days. The policy holder is also entitled to free operating room service, routine laboratory examination, ordinary drugs and surgical dressings, the association also defrays 25% of the cost of all special diagnostic procedures. The contract does not provide for the physicians' fees, and, of course, the individual has a free choice of physicians. As a means of lessening the burden of costs of medical care to the average individual, hospital insurance is proving its

TABLE VI
URBAN HEALTH EXPENDITURES
Hennepin, Ramsey, St. Louis Counties

Hennepin	1925	1935
Examining Insane	\$ 17,851	\$ 14,852
Public Health Nurses		8,709
State Institutions	13,000	67,387
Sanatorium	416,000	454,800
General Hospital	212,332	781,198
Health Department	122,871	146,996
Lymanhurst	47,789	32,433
School Health	103,407	116,190
Total Health	\$933,250	\$1,639,096
Ramsey		
Medical Aid incl		
Ancker H.	\$510,943	\$865,700
Health Bureau	141,622	95,992
School Health	48,627	36,404
Total Health	\$701,192	\$998,092
* St. Louis		
Health Department	\$ 23,004	\$ 25,570
Medical Aid	45,089	385,656
Sanatorium	178,715	215,104
Total Health	\$246,808	\$626,330

worth, but it has the disadvantage of any insurance in that it applies only to the provident and therefore has no effect on our problem of indigent medical care.

In conclusion, we wish to say that we are neither advocating generalized, socialized medicine nor condemning state medicine as it exists today. We have tried to present the facts as they are at the present time and readers are invited to draw their own conclusions as to whether or not we are traveling along the road toward complete socialization of medicine in Minnesota.

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Vitamin C and Tuberculosis

Charles K. Petter, M. D.*

Oak Terrace, Minn.

AN ABUNDANCE of literature has appeared in the last few years relative to the influence of vitamin C in both clinical and experimental tuberculosis.¹⁸ A review of this material reveals many interesting and pertinent facts. The purpose of the present paper is simply to analyze the published reports and to add a report of our experience with vitamin C feeding.

Guinea pigs on vitamin C deficient diets show decreased resistance to tuberculous infection and disease. Greene and his co-workers⁶ found a shortened survival period and decrease in body weight of infected guinea pigs, also demonstrating that generalized tuberculosis develops more rapidly in chronic vitamin C deficiency. De Savitsch, *et al*¹⁵ found smaller lesions and greater increase in weight in animals inoculated with tubercle bacilli and fed vitamin C than in the inoculated and untreated controls.

From the standpoint of intestinal tuberculosis, Smith¹⁰ produced intestinal ulcers in infected animals deprived of the vitamins found in cod liver oil and tomato juice (vitamins A, B, C, and D). McConkey and Smith⁵ conclude that the feeding of tuberculous sputum to guinea pigs was not the sole cause of intestinal ulcers. Their control animals fed adequate vitamin C developed ulcers in only two instances, as compared with 26 in the C deficient group. This same protection against the development of intestinal ulcers was demonstrated in guinea pigs on adequate vitamin C, by Hou.¹⁶ Animals infected with tuberculosis and allowed to develop scurvy show more tuberculosis than the control guinea pigs.

Clinically vitamin C deficiency is definitely demonstrable in all forms of tuberculosis, most marked in the febrile and destructive forms of the disease. While simply supplying adequate vitamin C will not completely reverse destructive processes of tuberculosis, the work of Hasselbach,^{2, 3, 4} Heise and Martin,¹ Schroeder,⁸ Stepp *et al*,¹⁴ Stub-Christensen,¹³ and Grant¹² show definitely that treatment with vitamin C has certain encouraging prospects in connection with tuberculosis in all forms.

Bronkhorst¹⁷ demonstrated that vitamin C in conjunction with cod liver oil and ultraviolet was attended by unusually good response in cases of intestinal tuberculosis. Body weight increased and the blood picture and general condition improved. Grant¹² has shown that the addition of vitamin C to an adequate diet increases the resistance to tuberculosis, while—interestingly—the addition of vitamin D to a C deficient diet lowers the resistance. Therefore more than calcium and vitamin D are necessary in tuberculosis, and vitamin C is the answer. Excess of D, with normal or reduced

calcium, tends to cause a spread of tuberculosis while a balance between vitamin C and D and calcium changes a reduced resistance to the level of a natural immunity or increased resistance. Lawrason Brown¹⁹ advocates a diet high in vitamin C with dicalcium phosphate and restricted sodium chloride, in the treatment of pulmonary tuberculosis.

The material for the present study is made up of 49 adults and 24 children, each one of whom was afflicted with some form of tuberculosis. The adult group was made up of 30 males and 19 females, ages ranging from 20 to 79 years. Bone tuberculosis was present in 7 individuals, bone and renal in 2 and renal in 1. Twenty-nine presented far advanced, seven moderately advanced and four minimal pulmonary tuberculosis. Ten boys and fourteen girls with ages ranging from three to five years made up the childhood group. Of these, thirteen presented osseous tuberculosis, while the remaining eleven were individuals afflicted with childhood type of tuberculosis and were 10 per cent or more under the standard weight for age and height.

Before beginning the feeding of vitamin C, part of the group was tested to determine the amount of cevitamic acid being eliminated each day. The urinary content of this vitamin was determined by the method of Tillmans and Hirsch²⁰ using dichlor-phenol-indophenol as an indicator in titration. Our findings from these determinations showed a daily elimination of from 3.6 to 8.74 mgm. of cevitamic acid which is far below the accepted normal of about 20 mgm. for an individual on an adequate diet. The general diet of these patients was supposedly balanced and adequate in vitamins, as figured on paper, and calculated to yield from 2800 to 3000 calories.

Vitamin C was administered, in this study, in a chocolate-malt-milk base. This preparation, cal-c-malt,[†] contains 50 milligrams of chemically pure cevitamic acid and 7½ grains of dibasic calcium phosphate in two heaping teaspoonfuls or 20 gm. This amount was given three times daily in a seven ounce glass of milk.

The patients then received, in addition to their general diets, an additional 654 calories per day, and 150 mgm. of vitamin C. This feeding was continued for an average of 21 days (11 to 30) until the urinary output of vitamin C reached, in those tested, an average level of 18.3 mgm. per day. At this point the amount of vitamin C per feeding was reduced and maintained at from 75 to 100 mgm., the urinary output averaging about the same as before (18.3). After four to six weeks of this feeding, the cal-c-malt was discontinued and only the glass of milk given. As a result the urinary vitamin C output dropped to below 14, and the body weight showed a tendency to fall off in most cases, al-

*Glen Lake Sanatorium, Oak Terrace, Minnesota and Instructor in Surgery, University of Minnesota, Minneapolis, Minnesota.

†Hoffmann-LaRoche, Inc., supplied the cal-c-malt used in this work.

though some patients maintained their increased weight and a few showed continued gain.

The most striking observation following the feeding of the vitamin C was the increase in urinary output of this substance. Next, as is shown in the accompanying charts (Figures 1, 2, 3, 4, 5) was the increase in body weight, probably due to the increased caloric intake, followed by some declines when the feeding was withdrawn. There was a greater tendency for weight increase and maintenance than for weight drop.¹¹ In the adult group the weight changes ranged from a loss of one pound to a gain of twenty in the far advanced group, from -1 to -13 in the moderately advanced, and -1 to -10 in the minimal pulmonary group. The bone cases showed an average of 3.5 pounds increase, although the range was from a 3 pound loss to a 12 pound gain. Changes in weight after the special feedings were stopped are shown as dotted lines in Chart 3, and range from a 3 pound loss to a 3 pound gain.

The children who were 10 per cent or more underweight showed weight gains ranging from 1 to 18 pounds or an average of 3.6 while those with bone lesions averaged 2.3 pounds increase.

A third observation not graphically demonstrable was the expression of the patients' general feeling of well being. The adults, particularly, in the majority of instances, volunteered the statement that they felt generally better while on the special feeding. A résumé of the X-ray and clinical findings in the adult group is shown in Table 2.

Comments

1. A preparation containing chemically pure vitamin C, dibasic calcium phosphate, and a sugar-cocoa-milk

base supplying also vitamin B₁ and B₂ has been administered to a group of tuberculous individuals.

2. This preparation as given in milk supplied 150 mgm. of vitamin C per day and added 654 calories to the regular diets.

3. Of the 49 adults treated, 30 showed definite improvement, 12 no change, and 7 are definitely worse.

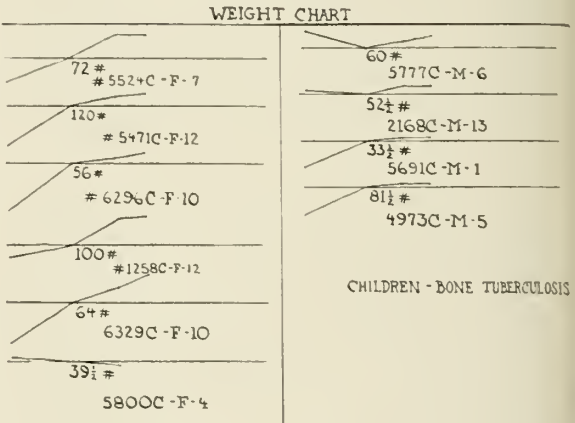


Figure 2. Weight Charts of Children with bone tuberculosis who were given cal-c-malt. (Base line and curves have same significance as in Fig. 1.)

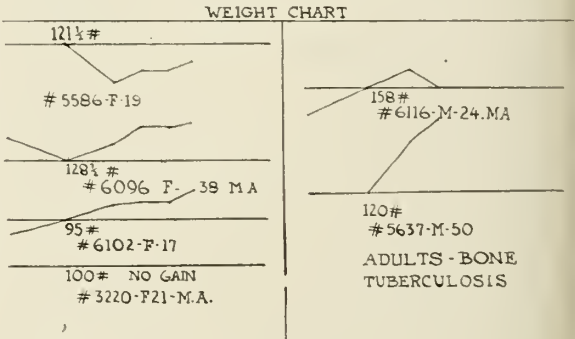


Figure 3. Weight charts of adult bone cases who were given cal-c-malt. (Base line and curves have same significance as in Fig. 1.)

TABLE I.

WEIGHT CHANGE			
	-	+	Average
Far Advanced Pulmonary	1	20	+5.
Moderately Advanced Pulmonary	1	13	+4.
Minimal Pulmonary	1	10	+4.
Bone Adult	-3	12	+3.5
Childhood Tuberculosis	0	1 to 18	+3.6
Bone Children	-1	5	+2.3

Showing range of weight changes and average gain in pounds for each class of patients receiving cal-c-malt.

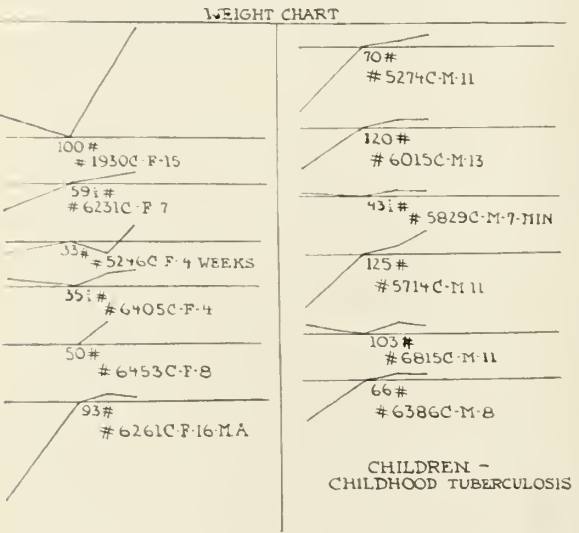
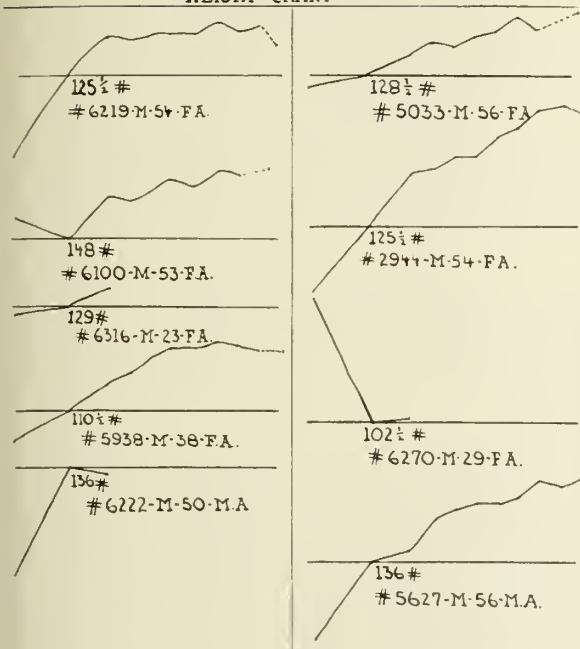


Figure 1. Weight Charts of Children, 10% or more underweight, who were given cal-c-malt.

(Base line in each case represents weight at time cal-c-malt feeding was started. Weight tendency during previous three months is shown at left, and weight changes during this study at right of point where curve crosses base line.)

WEIGHT CHART



WEIGHT CHART

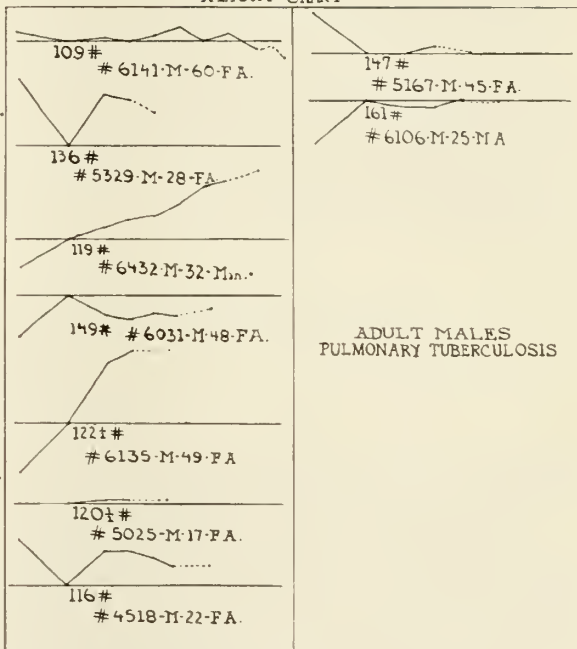
ADULT MALES
PULMONARY TUBERCULOSISFigure 4. Weight chart of adult male pulmonary cases who were given cal-c-malt.
(Broken line at right of curves show weight change after discontinuing—cal-c-malt).

TABLE 2.

No.	DISEASE	Improved	Unch'ged	Worse
4	Minimal Pulmonary	4	—	—
7	Mod. Advanced Pulm.	5	1	1
29	Far Advanced Pulm.	16	8	5
7	Bone Tuberculosis	5	2	—
2	Bone & Renal Tb.	—	1	1
49	TOTAL	30	12	7

Condition of adult patients based on clinical and Roentgen findings. Comparison made with findings 4 to 6 months before.

4. The children showed improvement in weight and general condition in 21, no change in 1 bone case and slight increase in bone destruction in 2 bone cases.

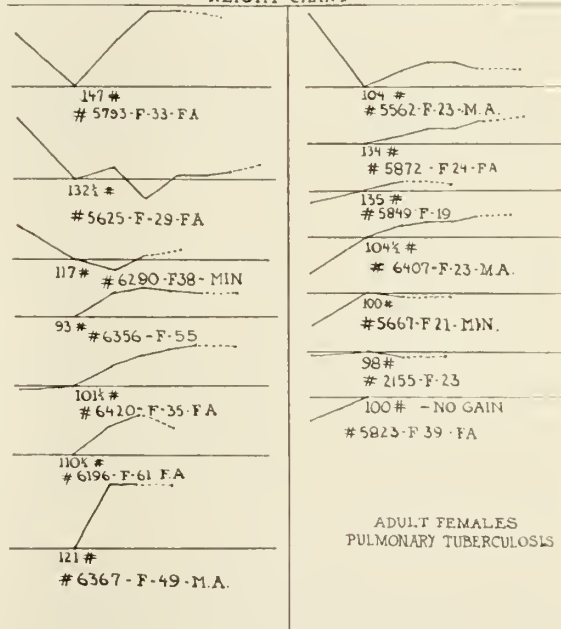
5. Elimination of cevitamic acid was found to be below normal in cases of advanced tuberculosis and was brought up to normal by feeding this vitamin in doses of 150 mgm. per day.

6. These observations were recorded over a relatively short period of time, and are presented so those interested may draw their own conclusions.

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WEIGHT CHART

ADULT FEMALES
PULMONARY TUBERCULOSISFigure 5. Weight charts of adult female pulmonary cases who were given cal-c-malt.
(Base line and curves have same significance as in Fig. 4.)

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The Cultural Side of A Doctor's Life*

J. G. Parsons, M.D.

Crookston, Minnesota

“**T**HAT indefinable something called Culture” I like to think of as affording a familiarity with and an appreciation of, things that are worthwhile—the ability to know good men and good things when you see them, or at least to know where they may be found, to the end that life may be enriched and enjoyed.

Obviously, the greater the range of acquaintance with things having a worthwhile content, the greater the possibility of extraction, whether we are in the realm of literature, art, music, philosophy, or what not. However, it seems to me that the doctor, by the nature of his position in society, where he ranks as a member of a learned profession, and by his constant practice in evaluating diagnostic data and the personalities of patients, is in an atmosphere peculiarly adapted for the development of culture.

Whether he thinks this art of worthwhile-ness is worthwhile and is, or should be, willing to put forth the effort necessary to its acquisition, is not the principal object of our consideration.

The ever-increasing complexity of medical lore makes it impossible to keep up, except in epitome, with medical literature. This has caused many a younger member of the profession to neglect the cultural side of his life and to make himself the slave of *Minerva Medica*, to the exclusion of many of the other things which make for the larger life, and to which he is entitled.

No one realized this more than Osler, who so often in his essays and addresses called attention to the importance of a “Liberal Education,” and pointed out how it may be acquired. Becoming educated is a lifelong process, to be worked out with such tools as one learns to use during his preliminary training in school and college. Unfortunately, there is so little time available in the usual premedical curricula, and, more fortunately, so little stress laid upon the cultural background which a doctor ought to have, that he finds himself, after several years of intensive study of the science and art of medicine, rather out of touch with what may be called general culture. He needs to acquire the habit of self

culture, which is the only true education, and to become worthy of his title of *Doctor*—a learned man.

I know of no greater cultural asset to any physician than an acquaintance with Osler's essays and addresses. Permit me to quote a bit of advice which he gave to medical students:

“A liberal education may be had at a very slight cost of time and money. Well-filled though the day may be with appointed tasks, to make the best possible use of your one, or your ten talents, rest not satisfied with this professional training, but try to get the education, if not of a scholar, at least of a gentleman. Before going to sleep, read for half an hour, and in the morning have a book open on your dressing table. You will be surprised to find how much can be accomplished in the course of a year. I have put down a list of ten books which you may make close friends. There are others; studied carefully in your student days these will help in the inner education of which I speak.

1—Old and New Testament. 2—Shakespeare. 3—Montaigne. 4—Plutarch's Lives. 5—Marcus Aurelius. 6—Epictetus. 7—Religio Medici. 8—Don Quixote. 9—Emerson. 10—Oliver Wendell Holmes—Breakfast Table Series.”

I have quoted this bit of Osler for the dual purpose of illustrating how highly such a master regarded general culture, and his insistence that it is within the reach of everyone who thinks it is worth while to acquire it.

The list of books given by Osler is suggestive. It may not make the same appeal to everyone, but it is significant that it offers to the medical man material which, ordinarily, in the rush of scientific reading which he, at least, is supposed to be doing, he is liable to neglect. It serves as an introduction to the general reading which makes for culture.

Poetry, drama, biography, essays and philosophy, are recommended as essentials of what Osler believed to be the education of a gentleman, and which every physician should possess. I take it that most of us feel the need of supplemental education, realizing that our preliminary schooling was abruptly ended by the intensive study of medicine which was so exacting in its demands that there

*Read at Grand Forks Medical Society, Jan. 1935.

was little or no time left for cultural subjects. Since engaging in practice there have hardly been hours enough in the day to get in all that might be desired in the way of reading or otherwise acquiring the things we feel we need. We may well take to heart the advice of Osler in appropriating a few minutes daily to this end.

It has seemed to me that there are approaches which are especially favorable to the medical practitioner who desires to broaden his intellectual horizon, in the writings of medical authors and in other literature which is filled with medical allusions. As one reads, listens to a lecture or a concert-actual or by radio, he inevitably encounters things which suggest limitations of his knowledge, which may be remedied. The notebook habit, as suggested by Abbé Dimnet, is an excellent means of reminding one what is to be done.

Let us suppose that we encounter some foreign names or expressions. We may not have had a preliminary education which has introduced us to other languages than our own, save the minimum amount of Latin required for the study of medicine. We may not be especially interested in the acquiring of an extensive knowledge of this kind, but it is easily possible by the Oslerian method to learn the Greek alphabet and to avoid speaking of "adenomatas" and other "phenomenas." We may well spend some time in acquiring a fair reading knowledge of one or more modern languages, and at least learn the correct pronunciation of names and terms commonly used. It is worth while knowing that *Gigli* is not pronounced "giggly" though such a sensation may be evoked. There is really no excuse for referring to the great psycho-analyst as "Frood," the father of bacteriology as "Pastoor," or the author of the famous work on ophthalmology as "Fewkes." Any good medical dictionary can set us right as far as these things are concerned.

However, there is something more of value in the satisfaction to be had from the ability to read an article in the original. This satisfaction is but a type of the values which inhere in all efforts at the attainment and acquirement of culture, of any kind. The physician may have these if he sets sufficient store on them, and is willing to follow Osler's advice to insist upon taking a little time each day in which to develop inner resources. He may be encouraged to cultivate this habit by reminding himself that in order to really enjoy the society of cultivated people he must, as it were, "speak their language." Not only is this desirable for his own satisfaction, but rather a part of his duty to society, in particular "the blessed company" of those who in any community, large or small, who stand for the finer things of life and are to a degree responsible for their preservation and encouragement.

Let me personally testify to the value of membership in a small group of people whose tastes are culturally inclined, and who meet for the discussion of topics of various kinds introduced by well prepared papers. This is an excellent corrective to the one sidedness of all the members of the group, including the doctors.

As working tools, to be kept bright by constant use, let there be some good dictionaries, including French, German, and Italian, and such others as occasion may demand.

One may not be especially interested in early English literature, but I venture to state that reading Chaucer's "Canterbury Tales" for the particular purpose of noting his frequent references to the medical lore of that period will prove interesting, and incidentally lead to an appreciation of this literary gem. The medical allusions of Rabelais, himself a physician, add a zeal to the reading of "Gargantu et Pantagruel."

So we might make mention of Conan Doyle, Warwick Deeping, Oliver W. Holmes, S. Weir Mitchell, and others among the writers of fiction whom every physician should number among his friends.

Among the essayists whom it will pay a physician to peruse are such men as Holmes, not only for his "Breakfast Table," recommended by Osler, but for his medical essays—a source of delight to one who will take the time to read them. His essay "On the Contagiousness of Puerperal Fever" is a classic. So also we find profitable Weir Mitchell, famous both as a novelist and a neurologist; Joseph Collins, whose "A Doctor Looks at Literature" and other essays, cannot fail to make an appeal to doctors, and Walsh, whose fame as a defender of the faith in his historical writings is so well known throughout the Catholic world.

The reading of medical history opens a wide field for reading a variety of literary works by physicians. We, of the profession are justly proud of their contributions. I discussed this in an article published some years ago, mentioning such names as Rabelais, Thomas Browne, Oliver Goldsmith, Keats, John Locke and several others including Wm. Drummond, whose poems in French-Canadian dialect are so delightful.

So we may be led into the fields of general history, ethnology and anthropology. For example; the bearing of malarial infection brought home after foreign conquests, on the decline and fall of the Roman Empire; the relation of caravan routes of trade and of the Crusades to epidemics of the plague; the part played by Mohammedan civilization in preserving the achievements of science and medicine; the weakening of native races by miscegenation and their death rate from the white man's diseases to which there was no established immunity; all these suggest an exploration of fields which add to our breadth of culture.

The spectre of bureaucratic and socialized medicine which is rising out of our present economic and political situation makes it imperative for us to pay serious attention to sociology and economics if we are to offer an intelligent resistance to the schemes of social theorists who lack the background of medicine. It is hardly necessary to point out the importance of something more than a superficial knowledge of psychology. The successful practice of the profession demands that; but to qualify for the leadership which is expected of us demands that we know about such things as intelligence

quotients, the inheritance of mental defects, mass psychology and the like.

An interest in philosophy, such as may be gained by reading Gomperz' "Greek Thinkers," recommended by Osler, or Will Durant's "The Story of Philosophy," is but another accomplishment which fits in with the suggestion of "speaking the language" of cultivated people. If only as a matter of professional pride it is worth while to read something of John Locke, physician.

While medical men are not usually concerned with theology, it is an inspiration to know that Albert Schweitzer, regarded as one of the great outstanding figures in the modern religious world, is a physician, taking up medicine in order to become a medical missionary in Africa after having achieved a world wide reputation as a theologian, and an equally great one as an organist and the preeminent authority of the music of Bach.

Speaking of music leads to the suggestion that the doctor is entitled to an appreciation of great music. With so much of it as is now available on the radio, one cheats himself out of a great source of enjoyment if he does not take the time to know something of the great composers and their work, the stories of the great operas and the work of great musical artists. Good music is as cheap as raucous, barbaric jazz. Cultured people prefer it.

What has been said of music applies equally to art. Feeling a sense of pride in the anatomist, R. Tait McKenzie, an authority on physical education and renowned as an American sculptor, or having an interest in the anatomical drawings of Leonardo da Vinci may be the portals through which we may enter the temple of art, there to receive the inspiration and satisfaction which comes from an appreciation of beauty.

If we mention drama, might we not make an approach to reading the modern drama (assuming, of course, that every cultured person requires urging to read Shakespeare) by reading the plays of Arthur Schnitzler, Viennese physician!

Time forbids further elaboration of the thesis that the doctor should be a cultured man. The few suggestions which have been made have been offered as an appeal to doctors to consider the importance of balancing their

interests—to add to their sources of enjoyment—to add to their equipment for usefulness, by developing the habit of culture. The inner resources which a man has are the most dependable, in spite of economic upsets and social changes.

To the younger man of the profession it means the storing-up of riches of the soul that enhance in value, like life insurance, the years to come. To those of us who are older, it means a source of satisfaction to take the place of the more strenuous exercise which may, perhaps, have taken too much of our time in earlier years.

The laity always have regarded the doctor as a learned man, as implied in the good old Latin word *Doctus*. He is looked up to, with the preacher, the teacher and the lawyer as a member of a "learned" profession. We owe it to them as well as to ourselves to be in fact what they expect us to be.

I like to think of culture as an investment. The time and energy required for the building up the reserve of this "indefinable something" calls for regular deposits—premiums, if you please. The investment is sound. The bank never goes "broke." Of course, like all other investments it calls for sound judgment—better a diversification of securities than putting "all eggs in one basket"—but I fancy it is a better dividend-payer than most of our investments have proven to be. It has often been objected that the busy doctor has no time to devote to such things; which is about as pathetic an alibi as is referring to them contemptuously as "high-brow stuff."

Those of us who have had the privilege of close acquaintance with some of the great men of our profession have observed that despite for greater demands upon their time than most of us, they have found time for just the sort of thing we have been discussing. They thought it worthwhile.

One of the New Testament parables is about a "pearl of great price." To obtain it, everything else was sacrificed. It is not expected that every doctor will be a connoisseur of pearls to that extent; but it is within the power of us all to make a collection of smaller gems, which in the aggregate will give us wealth which brings satisfaction—an enrichment of life which is eminently "worth while."

The JOURNAL LANCET

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MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

The Official Journal of the

North Dakota State Medical Association
South Dakota State Medical Association
Montana State Medical Association

The Minnesota Academy of Medicine
The Sioux Valley Medical Association

Great Northern Railway Surgeons' Assn.
American Student Health Association
Minneapolis Clinical Club

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MINNEAPOLIS, MINN., MAY, 1937

A SIGNIFICANT MEETING IN NORTH DAKOTA

Members of the North Dakota Medical Association may well be proud of its accomplishments during the first half century of its existence. It takes strong hearts to venture into new territory and blaze the trail. It takes courage to lay the foundation of any structure. Beginnings are arduous, prosaic, and often discouraging. But here we are with the corner stone secure, the super-structure well under way, and a machinery that has been functioning smoothly for five decades. Members of the association are no longer isolated pioneers practicing under the difficulties that handicapped the founders. On the contrary, they are enjoying the benefits of the cementing influence that such organization brought about; and scientific information and equipment that were unheard of in those early years are theirs to command.

Men of North Dakota, from the vantage point of opportunity on which fifty years of wise administration have placed you, it is yours now to carry on. You in turn are stretching your hands into the future with the power to mold the destinies of the group in years to come. We feel sure that the 50th annual meeting to be held at Grand Forks on May 16, 17, and 18 will be an outstanding success.

A. E. H.

SOUTH DAKOTA MEETING

As elsewhere indicated the Fifty-sixth Annual Session of the South Dakota State Medical Association will be held in Rapid City May 24, 25, and 26, 1937 with headquarters at the Alex Johnson Hotel.

The scientific program was published in full in the April issue and certainly is very inviting, covering as it does a large range of practical interest to the average busy practitioner.

Organized medicine serves to set up standards, rules of conduct, and principles of ethics. Each member of the profession owes it to himself and to the organization to give time and thought to the formulation of such rules and regulations as shall redound to the honor and best interests of his group. With changing times and legislative enactments it has become necessary for the physician to keep abreast not only with medicine but also with legislation, judicial decisions, and social regulations. The state association, through its various officers and committees, is prepared to discuss these matters with the membership and act as a clearing house for the dissemination of knowledge when new demands are made. Never was it more important than now for physicians to attend association meetings.

A. E. H.

ANNUAL PEDIATRIC ISSUE

In accordance with the custom that has been observed for the past few years, the May issue of *THE JOURNAL-LANCET* is devoted particularly to the field of Pediatrics. It brings to its readers a variety of subjects dealing with an important part of each physician's private practice. This special issue of *THE JOURNAL-LANCET* is an expression of a desire to aid physicians in the care and treatment of infants and children.

THE SOCIALIZATION OF MEDICINE

Physicians who are not aware of the degree to which the practice of medicine has already been socialized doubtlessly will be surprised, and possibly disturbed by pertinent facts published in this special number of *THE JOURNAL-LANCET*, which reveal how firmly and deeply this change is rooted in Minnesota, and how prolifically it is growing.

Although the development of preferred alternatives for the socialization of medicine obviously transcends individual ability, nevertheless the suggestion is offered that adequate medical care will be quite generally available to patients with limited resources when legislative bodies provide state medical associations with funds which official representatives of these responsible organizations can use for the special purpose of partially compensating physicians for professional services they are now unable to render without financial assistance. This suggested alternative for the drift toward pure socialization extends to legislatures the privilege of subsidizing splendid humanitarian programs fostered and supervised by major component units of the American Medical Association whose individual members are acquainted with local needs that reasonable aid should enable them to supply. This plan permits the public to assist the profession in making adequate medical care universally available. Consequently it probably deserves to be considered "Public Aid to Medicine" rather than "The Socialization of Medicine."

Doubtlessly methods superior to the one that has been briefly outlined can be devised for enlisting the public and the profession in a cooperative and mutually beneficial venture which preserves for patients with limited resources the privilege not only of selecting the physician they prefer, but also of receiving private attention. If the development and promotion of plans which favor the attainment of these objectives is desired, necessary leadership probably can be recruited from the ranks of the profession provided State Medical Associations avail themselves of the services of physicians, who, through their publications, have demonstrated a profound knowledge of the drift toward the socialization of medicine.

C. A. S.

A NEW PLAN

We desire to call the attention of every medical practitioner to a series of editorials by Mr. E. H. Bobst, which richly deserve the attentive perusal of every physician.

Mr. Bobst presents very pertinent, and well deserved criticisms of efforts made by the medical profession and different pharmaceutical houses to publicize medicine, and bring more patients to the physicians and fewer patrons to patent medicine vendors, quacks and charlatons.

Mr. Bobst offers definite, practical advice as to methods to be pursued in bringing medicine, both as an art and science, before practically everyone in the United States, and stands ready to "start the ball rolling" by pledging his company to contribute \$20,000.00 annually for five years toward an annual fund of \$400,000.00, to be contributed by ethical pharmaceutical houses, and turned over to the A. M. A. without strings of any sort being attached. The said amount to be used for publicizing medicine. He outlines very thoroughly plans for bringing this campaign to our people over a nation-wide radio hook-up, which, with fees of advertising experts to handle said program, together with talent and radio expenses, he estimates to cost \$400,000.00 for forty weeks in each year. He further is most convincing in his argument that this contemplated program is entirely ethical, and that in it also will be found our most effective means of combating attempts to introduce socialized or state medicine.

Do not fail to read these editorials by Mr. Bobst, which may be obtained in a reprint by addressing him at Nutley, N. J., in order that you may be prepared to intelligently discuss and assist in completing the good work so well begun by Mr. Bobst.

W. A. G.

SOCIETIES

PROGRAM OF THE
NORTH DAKOTA STATE MEDICAL
ASSOCIATION

50th Annual Session at Grand Forks, N. D.

May 16, 17, and 18th, 1937

House of Delegates meets Sunday, May

SUNDAY, MAY 16—

House of Delegates meets at 2 P. M.

Concert in New High School Auditorium by the University Faculty of Music at 8:30 P. M. Public Invited.

MONDAY, MAY 17, 1937—9:00 A. M.

"Treatment of Burns," with demonstration of the Rapid Tanning Method by Natural Color Motion Pictures. W. A. Wright, M. D., Williston, N. D.
"Problems in the Diagnosis and Treatment of Gastro-intestinal Hemorrhage." D. C. Balfour, M. D., Rochester, Minn.

"Cancer." H. M. Berg, M. D., Bismarck, N. D.

"Fractures of the Upper Extremity." Geo. A. Williamson, M. D., St. Paul, Minn.

SPECIAL GOLDEN JUBILEE PROGRAM. In charge of Dr. James Grassick, Grand Forks, N. D.

NOON RECESS—

AFTERNOON SESSION—1:30 P. M.

"Bone Marrow," Its Vital Importance to the Body. E. L. Tuohy, M. D., Duluth, Minn.

"The Management of Nephritis," W. H. Long, M.D., Fargo, N. D.

"Initial Care and Treatment of Accidental Injuries," R. H. Waldschmidt, M. D., Bismarck, N. D.

ANNUAL BANQUET

HOTEL DAKOTA—6:30 P. M.

President's Address, W. A. Gerrish, M. D., Jamestown, N. D.

Guest Speaker, E. L. Tuohy, M. D., Duluth, Minn.

TUESDAY, MAY 18, 1937—

"Course, Conduct and Complications of Pregnancy among Physicians Wives." R. D. Mussey, M. D., Rochester, Minn.

"Anesthesia and Relief of Pain by the General Practitioner." John S. Lundy, M. D., Rochester, Minn.

"Problems in the Diagnosis of Obstruction in the Bowel." Kent Darrow, M. D., Fargo, N. D.

"A Discussion of Protamine Insulin." R. O. Goehl, M. D., Grand Forks, N. D.

NOON RECESS—

During Noon Recess the North Dakota Health Officers Association will hold a luncheon beginning at 12:15.

Address by Dr. C. C. Applewhite, Surgeon, U. S. Public Health Service, Chicago, Ill., "Present Trends in Public Health Administration."

AFTERNOON SESSION—

Symposium On Venereal Disease.

1. "Public Health Aspects of the Control of the Venereal Diseases," H. G. Irvine, M. D., Consultant in Venereal Diseases in the Minnesota Department of Health, Minneapolis, Minn.

2. "Present Status of the Treatment of Gonorrhea in the Male." L. W. Larson, M. D., Bismarck, N. D.

3. "Treatment of Syphilis," Paul O'Leary, M. D., Rochester, Minn.

4. "Developments in Communicable Diseases Control," K. F. Maxcy, M. D., Director Department of Preventive Medicine and Public Health, University of Minnesota, Minneapolis, Minn.

SPECIAL PROGRAM
NORTH DAKOTA ACADEMY OF
OPHTHALMOLOGY AND
OTOLARYNGOLOGY
at Hotel Dakota, May 17, 1937

LUNCH AND ADDRESS—12:30

Dr. Arthur E. Smith, Los Angeles, California.
"Reconstructive and Plastic Oral Surgery."

The North Dakota Health Officers' Association
Annual Conference, Grand Forks,
Tuesday, May 18th.

This conference is open to all physicians and they are urged to attend. A splendid program has been arranged. It should be of practical value to all physicians, whatever their interests in public health problems may be.

The Symposium on Venereal Diseases will include papers of a practical nature on the treatment of both syphilis and gonorrhea.

Please note that this conference will be held after the sessions of the State Medical Association have closed. We hope that all who plan to go to Grand Forks will arrange to stay over for this conference Tuesday afternoon.

L. W. LARSON, M.D.
President

SCIENTIFIC PROGRAM OF THE
MINNEAPOLIS CLINICAL CLUB

Meeting of January 20, 1937

DR. DONALD McCARTHY, Presiding

ANNUAL SENIOR MEMBER PROGRAM

Arranged by DR. S. R. MAXEINER

AUTOPLASTIC NERVE GRAFT IN FACIAL
PARALYSIS

DR. KENNETH A. PHELPS

My purpose in presenting this subject is primarily to call attention of this group to the work done by Ballance and Duel in establishing experimentally and clinically that restoration of continuity of the facial nerve is the only satisfactory means of dealing with facial palsy, in all but exceptional cases. That this work is not thoroly familiar to general surgeons is shown by a paper read in 1935 before The Western Surgical Association by Loyal Davis. In this paper on *The Surgical Treatment of Facial Paralysis* no mention is made of Ballance and Duel's articles. Davis' paper deals with facial transplants and nerve anastomoses only, though the statement is made, "end to end suture is the ideal treatment, but it is a difficult and serious procedure in the course of the facial nerve within the facial canal." Adson says in discussion: "Wait six months for spontaneous regeneration, and if positive the nerve is cut, wait six weeks after the wound is healed before operating."

Following the anastomosis, association movements of the face are present; in moving the tongue when the hypoglossal is used, or the shoulder when the spinal accessory is used. At times paralysis of the muscles supplied by the anastomosed nerve results.

In order to work on the problem of facial palsy, Sir Charles Ballance of London, came to this country in 1931, at the age of 76, after he had retired from practice. He joined Dr. Arthur Duel of New York City, who was 61 at the time, and in a laboratory at Dr. Duel's country home they conducted experiments on animals, mostly monkeys. It is with sincere respect that I pay tribute to these gentlemen—both having died a few months apart in 1936.

Ballance and Duel published the results of their experiments in 1932. They first did the anastomosis operation. Later, in order to discover the effect on a nerve graft, they cut a segment out of the facial nerve and replaced it in the bony facial canal, some times with the ends reversed. Next they used other nerves, sensory or motor, for the graft, and in all cases they found that the function of the facial nerve returned. First the face became symmetrical, due to the restoration of the normal muscle tone. Second, voluntary control appeared, and third to return were symmetrical movements induced by emotional stimuli.

With the fact established that the facial nerve could be repaired by merely placing one or more grafts in the bony canal between its cut ends, without suturing, they went on to determine when to operate on a case of facial paralysis.

Recovery is spontaneous in many cases of facial palsy following mastoid surgery. Particularly those in which the paralysis appears some time following the operation. Most of these never have reaction to regeneration. In other cases, with reaction to degeneration, changes in the galvanic responses enable the observer to recognize the moment recovery begins. If faradic contractibility has long been lost, no one can foretell spontaneous recovery, and immediate operation is advisable. The nerve should be exposed and any pressure removed, such as a fragment of bone pressing on the nerve. The nerve sheath should be slit, thus doing a decompression. This results in complete recovery while the best that can be hoped for without operation is partial recovery. If the nerve is found to have been cut, a graft can be inserted. If there is no galvanic response present, it means the muscle fibers are atrophied completely and no operation is advised.

If the facial palsy is not traumatic in origin, as Bell's palsy, Duel advises operation when the faradic response is persistently absent for two or three days, meticulous asepsis is required.

In cases of facial palsy due to fracture or gunshot wounds, the same advice is given, providing one knows where the nerve is injured so it could be decompressed. Otherwise anastomosis is advisable. Even in this situation, some of Duel's disciples believe that repair of the nerve is possible without anastomosis.

The presence of suppuration is no contraindication to operation.

In 1934 Duel reported 69 operated cases. Twenty-nine were decompressions and forty were grafts. The length of the graft averaged 20 mm., the shortest 7 mm., and the longest 40 mm. He noted in the decompression cases that the return of the faradic response occurred in a few weeks but in the graft cases it took several months. This difference he explained as being due to the time required for the degeneration of the fresh graft, which is necessary before new axons could grow through it into the distal part of the nerve which is already degenerated. Hence, he now advises that the graft be prepared by letting it degenerate 2 or 3 weeks before using it. In 30 cases so handled he found the time of response around $\frac{1}{4}$ to $\frac{1}{2}$ of that formerly required. He even tried homoplastic grafts (same blood group) and in 5 cases all were satisfactory.

Technique of the operation consists of exposing the facial nerve from the stylo mastoid foramen to the geniculate ganglion, doing a radical mastoidectomy if necessary to get proper exposure. The nerve to be used as a graft, anterior femoral cutaneous, is cut three weeks before, and one or more segments of the degenerated end are placed between the cut ends of the facial nerve. The graft is protected by gold foil and the wound packed with gauze strips soaked in saline solution. Daily dressings are required.

Sullivan of Toronto advises waiting six months before placing the graft to avoid the occurrence of spontaneous spasms, but others disagree with him and state better results are obtained by the earliest possible operation.

Duel and Tickle in 1936 reported on 120 cases operated. They state perfect facial expression does not return but the results are far better than by any other method of treatment.

Case Report

Mr. E., age 35, was operated upon for acute left mastoiditis February 23, 1935. During the operation a large sequestrum was removed which involved the entire tip of the mastoid process. Upon removal of the anesthetic mask a complete left facial paralysis was observed.

March 9, 1935, mastoid cavity reopened. The posterior canal wall was taken down and a break in the nerve was found in the descending portion about 15 mm. in length. The lower end of the cut nerve was found at the stylo mastoid foramen. With the assistance of Dr. Zierold, a piece of an intercostal nerve was obtained. Two strands of it were placed between the freshened cut ends of the facial nerve and a piece of muscle was transplanted to form a bed for the graft. Gold foil was

placed on the graft, and upon this some pieces of rubber sponge, held in place by saline moistened gauze strips.

The pleura was perforated at the removal of the graft and some chest pain with respiratory difficulty was present for a few days, no temperature.

The wound was dressed daily, replacing the moist gauze packs and removing the pieces of sponge. March 23, the gold foil was removed and the graft could be seen covered with healthy granulations. A plastic closure of the wound was done March 25, 1935.

The patient had to wear protecting goggles because of his inability to close the left eye. He went home and on September 5, 1935, twitching of the angle of the mouth was seen on closure of the left eye.

March 29, 1936, great improvement. Can close eyes and move cheek and mouth. Discarded protective goggles. Ear dry and hearing serviceable.

Discussion

DR. O. J. CAMPBELL: I would like to ask Dr. Phelps what results these men obtained with their cablegrafts. In general surgery we have found that if there is a defect in a peripheral nerve, the results obtained by transplanting nerve, the so-called cablegrafts, are not very satisfactory. If good results are obtained in transplanting nerves for the repair of injured facial nerves, I am wondering if the preservation of the bony canal is not the important factor in helping to direct the newly developing axones.

DR. R. C. WEBB: At the meeting of the Western Surgical Association in 1933 Dr. Loyal Davis discussed the transplantation of nerves and the scar formation in the distal end of the peripheral nerve which may cause an apparent failure of the graft. It is then necessary to resect this scar and resuture in order to permit the continuation of the growth of the nerve. I would like to ask Dr. Phelps if there had been any failures in his studies of these short grafts and if so, what were the causes of the failures.

DR. KENNETH A. PHELPS: In dealing with facial nerve you have a bony canal, rather a small definite place, and when you put the graft in the canal it stays pretty nearly in contact with both ends of the injured nerve, as Dr. Campbell suggested. This is a great advantage, I think, over dealing with nerves in soft tissue. Drs. Duel and Ballance have not had to do any secondary operations and their results have been phenomenally good. The percentage of satisfactory results has been very high.

RECENT ADVANCEMENT IN THE TREATMENT OF DIABETES*

ARCHIE H. BEARD, M.D.

During the last five years our conception of etiology, physiology, and treatment of diabetes has changed completely. Today we are standing on the threshold of a new era in diabetes. The Banting era, which we are just leaving, was a great advancement. During the last fourteen years, diabetics have gained hope, food, and strength. Insulin has given life to their dry bones and tissues until, at the present time, they are a group of people nearly as strong as the normal individual.

Our greatest problem has been the treatment of complications. Diabetic coma has been undiagnosed and carelessly treated by many physicians during a period when we should have had a decrease in this severe complication. With the use of protamine insulin we hope for greater results especially in our previously diagnosed cases. The severe diabetics probably will receive the greatest share of this new discovery. Before we discuss treatment in detail, there are other things that should be reviewed.

In regard to etiology, the newer research indicates that all cases of diabetes are genetic and possibly pituitary in origin. If we had not been able to prolong the life of the diabetic with the use of insulin, the duration of their lives would have been so short that data of family histories would never have been complete. The actual evidence that diabetes is hereditary rests primarily on four facts:

*Presented January 20, 1937, to the Minneapolis Clinical Club, Minneapolis, Minnesota.

1. The almost simultaneous development of diabetes in similar twins.
2. The greater occurrence of diabetes in diabetic families than in normal families.
3. The demonstration of the Mendelian recessive ratios in a large series of cases selected at random.
4. The occurrence of diabetes in latent cases.

In regard to the first statement little need be said except that statistics have shown 70% of similar twins develop diabetes at the same time in comparison to only 12% of dissimilar twins. In regard to the second statement, diabetes occurs nearly seven times more often in the parents and siblings of diabetics than in the relatives of non-diabetic patients. In regard to the third statement, or the Mendelian ratios, we expect 100% of the offsprings of two diabetic individuals to become diabetics; in the cross between a diabetic and a hereditary carrier, 50%; in the cross between hereditary carriers, 25%. However, this does not always occur, but at least we can state that diabetic individuals develop in a definite ratio, and the further an offspring is from the original diabetic the less opportunity he has to develop the disease. If my time were not so short, I would discuss this more fully. However, we realize this does not cover all the possible etiological factors in diabetes.

Endocrine functions are known to be controlled by the Mendelian recessive genes, *e. g.* dwarfism in mice and cretinism in humans. Houssay has suggested two possible complications that might control the pancreas, first, hyperactivity and second, hypoactivity of the pituitary gland. Hyperactivity of the pituitary gland, theoretically, is associated with an excess of the diabetogenic factor of Houssay, whereas hypoactivity of the pituitary gland is consistent with a lack of the pancreatic hormone of Anselmino and Hoffman. Evidences of both hyperactivity and hypoactivity can be found in clinical cases of diabetes. The hyperactivity is suggested by the over growth that occurs in 90% of our diabetic children prior to the onset of the disease. This occurs at the age when hyperactivity of the pituitary gland is most pronounced, as for example between the ages of six and twelve and again at the age of fifty, when diabetes in elderly people is likely to develop. In contrast to this, obesity in the adult and dwarfism in some diabetic children suggest hypofunctioning of the pituitary gland. Hyperactivity of the pituitary gland is associated with the more severe clinical case of diabetes, and hypoactivity with the milder form.

In regard to treatment, all of us have seen many forms arise, but the fundamental principles are the same, namely:

1. To maintain weight, or, if the patient is a child, to promote the normal rate of growth and development.
2. To keep the urine practically free from sugar, and maintain the blood sugar at normal levels.
3. To control fat metabolism.
4. To prevent acidosis.

In regard to dietary treatment, it depends to a great extent upon the severity and the age of the patient. With a co-operative adult diabetic over fifty years of age treatment has never been difficult, and the end results usually have been good. The end results with a severe and young diabetic have been less satisfactory; consequently, many forms of dietary treatment have been used. This concerns principally the division of the diet into its various parts, namely, carbohydrates, proteins, and fats rather than total calories. Today it is generally recognized that the average adult over fifty years of age will maintain a normal weight provided he receives 30 calories per kilogram body weight. The child will grow at a normal rate if he receives 100 calories per kilogram body weight during infancy, gradually decreasing this to 45 calories during adolescence and to 35 calories during early adult life. Every possible variation of carbohydrates, proteins, and fats has been used for the severe diabetic. There has been brought forth the use of low carbohydrate and high fat ratios; moderate carbohydrate, moderate protein, and moderate fat ratios; high carbohydrate and low fat ratios; and high protein and low protein ratios. Probably the happiest end results for an adult patient is a carbohydrate value between 100 to 200 grams. The child generally is happiest when he receives between 150 to 250 grams, and a 2½:1

or 3:1 carbohydrate-fat ratio. It is relatively an easy problem to get a diabetic patient sugar-free if one to two hourly specimens are collected for examination unless acidosis is present. We are interested mainly in attempting to have the patient have, also, a relatively low blood sugar. For that reason fasting blood sugars are taken if the patient is not using insulin, and blood sugars at eleven-thirty in the morning if the patient is using insulin. This has been shown to be the best times at which to determine blood sugar levels. In the Banting era our greatest problem was to keep the patient from developing peaks of hyperglycemia and periods of hypoglycemia. It was difficult to keep the patient sugar-free and maintain the blood sugar at a fairly normal level. This was true especially of the severe diabetic. The new protamine, however, has revolutionized our treatment, and the severe diabetic will benefit mostly from the use of this new material. As a rule the youthful and severe cases show an elevated fasting blood sugar well over 300 mgs. After the third year the blood sugar is inclined to be somewhat stable, and, as a result, the disease is apt to show no further increase in severity as indicated by the fasting hyperglycemia. With regular insulin it became customary to give a dose of insulin between ten o'clock at night and midnight or at five o'clock in the morning. The first method resulted in an abrupt fall of the blood sugar to hypoglycemic levels followed by a spontaneous rise, so that, even with this extra dose of insulin, the fasting blood sugar was relatively high. Insulin given at five o'clock in the morning, or earlier, controlled night hyperglycemia, but it was very inconvenient. Therefore, we realize that our next improvement in the treatment of this disease lies in developing a relatively stable level for the blood sugars through the twenty-four hour period. This was Dr. Hagedorn's theory.

I shall not go into the principles and the development of this material. All of you appreciate what protamine insulinate is. With protamine we have been able to develop a hydrogen-ion concentration of 7.3 compared to approximately 2.5 to 4.0 (usually 3.0 to 3.5) of our regular insulin. Therefore, protamine insulin appears to remain in the body nearly twice as long as regular insulin, or, in other words, it is not absorbed as rapidly. The drop in the blood sugars is more gradual; consequently, the rise is more gradual. As a result, insulin reactions are reduced a great deal. However, protamine insulin can never replace regular insulin when rapid absorption is needed as in diabetic coma and infections. Protamine is principally a material to be used in the treatment of diabetes when complications are not present. Furthermore, it cannot replace regular insulin in the treatment of severe diabetes and coma. At first we used regular insulin in the morning when we wanted rapid absorption, and protamine insulin in the evening. In that way we attempted to have the patient awaken with a normal fasting blood sugar. Many of those individuals who had to take four to five injections of regular insulin a day are now able to reduce their injections to two or three a day. In milder cases, in some instances, patients have been able to take a larger amount in one injection, and remain relatively sugar-free for twenty-four hours.

Apparently diabetes is increasing throughout the world, and especially in the United States. At least the statistics from all the large diabetic centers, *e. g.* Joslin's clinic, the large hospitals in the East, and the Mayo Clinic, show a constant increase in the number of cases in the last ten years.

Our patients are living longer with this disease, and, naturally, complications are bound to arise. In many instances a diabetic's death is attributed to a disease other than diabetes. The most serious complication with which we have to deal is still diabetic coma. There is a peculiar feeling among the laity, and especially among some diabetics, that the treatment of diabetes does not pay. Those of us who saw the diabetics in the days before the Banting era realize the seriousness of (1) the intercurrent crisis of coma, (2) the severe loss of weight and strength, and the failure of growth in young individuals, (3) the loss of resistance and death from septicemia, and (4) premature aging. On going into these factors in a superficial way, I might state that diabetic acidosis still occurs more often than

it should, and that it occurs most frequently in severe diabetes. Insulin has changed the picture entirely, and has reduced the total mortality of severe coma from nearly 100% to 14% in the entire Joslin coma series, or 1% in his patients who have had the disease over fifteen years of age. The causes of coma usually are (1) breaking the diet, (2) omission of insulin, (3) infections, and (4) diseases of glycogen storage bodies, *e. g.*, extensive diseases of the skin, liver, and muscles. We now have to add a new factor (5) endocrine imbalance. This has been noted especially by Bertran, who has suggested the greater increasing frequency of diabetic coma during pregnancy and catamenia. At this period the individual is inclined to have a relatively low alkali reserve and a low blood sugar, even as low as 190 mgs. This is merely to warn against the inter-currence of acidosis during pregnancy, and particularly to warn the patient of the extra care and re-adjustment of insulin which may be necessary at the time of catamenia. First, there can be no question or doubt that insulin given in the first twenty-four hours and in large and divided doses, ranging from 10 to 1,000 units, is still an essential part of our treatment. Recently it has been brought to my attention that some diabetic clinicians feel that diabetic acidosis should be eradicated with not more than 50 units of insulin. This is not the opinion of other men, including myself, and I wish to emphasize this fact. Second, the results from diabetic acidosis, also, depend upon combating the dehydration. 1500 to 8,000 cc. of normal saline generally should be given the first six hours, and, on general principles, it cannot be over done. Third, frequent gastric lavage and enemas to counteract loss of gastro-intestinal tone is very essential. Fourth, concentrated glucose, 50%, or concentrated salt solution, 10%, may counteract renal retention. Fifth, adrenalin and rarely blood transfusions are of use in circulatory collapse. Sixth, 100 grams of glucose should be given by mouth, if possible, the first twelve hours.

The argument over the use of alkalis to prevent increasing acidosis is again being brought forth. Joslin's series show a mortality of 0.7 of 1% in treated diabetics. This has not been improved upon by the statistics of the Mayo Clinic, although that organization has shown very good results with a combination with or without alkali therapy. Hartman, however, criticises the non use of alkalis. In diabetic children especially he uses racemic sodium lactate, although his series show a mortality rate eighteen times that of Joslin's series, or nearly 13%. In the University Hospital we rarely have used alkali therapy except in severe and prolonged cases in dehydrated individuals when we felt alkalis might be of some value. As long as our mortality rate remains as low as it has in the past we feel justified in not using alkalis. It has been Joslin's theory that the harm was not especially from the use of alkalis, but was in the false sense of security given by the rapid rise of the alkali reserve, and, in doing so, the fundamental fault, or lack of using insulin, has been overlooked. It has been shown that in the patients treated without alkali, one could expect a rise of only 12 volume per cent in eight hours. Hartman has advocated the use of only 2 units of insulin per kilogram body weight, and none for six hours afterwards. We feel this is not sufficient in severe acidosis, and in some instances we have used as high as 14 units per kilogram body weight. Thus the old question of the use or non use of alkalis, which was lost after insulin was discovered, again has come forward. The hypoglycemia, or another of the difficulties in the treatment of diabetes, should be eliminated with the use of the new protamine insulin. If hypoglycemia should occur with protamine, it must be remembered that it takes possibly a larger amount of carbohydrates over a prolonged period to keep the patient from returning to the insulin reaction.

A severe diabetic is apt to develop skin lesions, which includes the new disease described by Michelson and Laymon, *Necrobiosis Lipoidica Diabeticorum*. I shall not go into this in detail because it has been discussed frequently in this region due to the wide recognition these two men have in dermatology. I wish to state, however, that it seems to be due to fatty degeneration of connective tissues followed by deposits of lipoids. In some areas these lesions become necrotic, and appear

to be what approaches actual gangrene. It will be interesting to see if the use of increased carbohydrates under a new regime of lower blood fats and low blood cholesterol will control this condition.

I do not wish to discuss the subject of dwarfism tonight, but this remains an essential part of the treatment by the pediatrician, who must be certain that his patients grow and develop normally. There is a certain percentage of them that will not do so under any regime, and this probably occurs when there is a hypoactivity of the pituitary gland and lack of growth hormones, and is not due to a definite under nutrition. Houssay has demonstrated in one diabetic dwarf, on whom he was able to perform an autopsy, that there were actual scars in the pituitary gland, which probably had some definite relationship to the lack of pancreatic hormone, which is thought to produce diabetes, as well as a lack of growth hormones, which, also, produced dwarfism in that individual. The use of thyroid and pituitary gland extract has not always been successful.

Another interesting complication is the enlargement of the liver, which recently has been reported in many juvenile diabetics. In some instances the liver has been felt as low as the iliac crest. These patients are apt to have a pronounced protuberance of the abdomen. They present serious problems because they are very unstable, and they are liable to develop frequent attacks of insulin reactions and diabetic acidosis. The cause of the enlargement is not definitely known; theoretically it may be due to an excess of fat or to an excess of glycogen deposited in an abnormal fashion in the liver. Most autopsies have shown fatty infiltration of the liver. Liver function tests reveal very little. However, the relation of free cholesterol to cholesterol ester has been reported lower in the experimental animal; therefore, the function of fat metabolism in the liver may be defective. Best and Hershey have reported excellent results in the use of cholin, lecithin, or whole pancreas. The most remarkable results, however, have been reported by Hanson, a co-worker of Hagedorn, who has noted the disappearance of the enlargement of the liver after the use of protamine insulin. I, also, have been one case in which this has occurred, and Dr. Platou has reported to me a similar case in his private series. Time, only, will tell whether or not protamine alters the fat metabolism or increases the storage rate of glycogen. At present the liver and the ductless glands are bee hives for experimental activity in diabetes.

Joslin states an analysis of the long duration cases gives a picture of the end results of severe diabetes. He reports that in his juvenile series he finds 5% have survived fifteen or more years of the disease. Of this series 4 have died, 19% have had coma at various times, 43% show evidence of arteriosclerotic vessels, 28% have retarded growth and development, 8% have had infections, none have had tuberculosis, 6% have had cataracts, and 6% have had neuritis. It is still his conclusion that excessive fat is the cause of these degenerative changes. He hopes to control this condition with the use of protamine and a higher carbohydrate and lower fat diet than he has used in the past.

Another factor which has been brought to my attention this last year is the unfavorable effect of diabetes complicating pregnancy, not resulting as much in paternal mortality, which, fortunately, is low, nor in the grave progression of the disease in the mother, but in the rather frequent occurrence of accidents to the fetus as a result of toxemia, eclampsia, coma, and hypoglycemia. In Joslin's series of 271 pregnancies between the years 1898 and 1935, he found practically one-half of the cases had been in the pre-insulin era and one-half in the insulin era. It is surprising to find only slight improvement of the insulin over the pre-insulin days. He found stillbirths have dropped from 29% to only 25%, and miscarriages and abortions from 22% to 16%. Therefore, we are concerned with the investigation and manner in which diabetes contributes to these conditions. Early abortions and miscarriages generally are attributed to the disease itself for its incidence is three times more frequent among diabetic patients with hyperglycemia and glycosuria than in the controlled cases. We

realize the impregnated ovum is implanted in that portion of the uterus which has the richest supply of glycogen, and this may be the reason for miscarriages occurring early in uncontrolled cases. Toxemia and eclampsia occur fifty times more often in the diabetic than in the normal mother. This is most common in the younger mothers who are severe cases. The severity of the disease rather than its control seems to favor the occurrence of this complication. Stillbirths, also, occur relatively frequent. For years the obstetrical-diabetic literature has contained accounts of the large number of cases in which the over developed, macerated fetus has been born to the diabetic mother. We realize, also, that this is not an unfulfilling characteristic of diabetes. However, the fact that one-half of the pregnancies ended successfully prior to the general use of insulin shows without further comment that insulin has not been of great value. The cause of this over development, which is characteristic of so many diabetic pregnancies, has never been quite clear. It is natural that it should be attributed to over nutrition and the elevation of the blood sugar and blood fat, but this is not the case in Joslins' series. It is true that all these factors need further investigation, but a new and interesting clue has been found in the reports of G. V. Smith and O. W. Smith. They have demonstrated an excess of prolactin characteristic of the toxemia of pregnancy, and that it is likely to be more frequent in the toxemia of the diabetic pregnancies. Schneider and Hoopes have demonstrated that injections of prolactin in animals gave the picture we have in diabetes, namely over development, death, and maceration of giant rat and rabbit fetuses. Smiths' work has been under way for at least a year. Three of their nine clinical cases showed a definite increase of serum prolactin while the remaining six had normal prolactin. All three of these mothers were delivered of a giant type of fetus. Thus two definite forward steps have been reported. First, Titus decided to deliver these patients prematurely, therefore, anticipating the death of the fetus *in utero*. This has been unsatisfactory, and we know that all these patients are not predestined to develop this complication. Therefore, we have no positive way of telling when it will and will not occur. As yet I am not thoroughly convinced that it is the treatment of choice to do a Caesarean delivery on these individuals as is being advocated by some physicians and clinics throughout the country. Smiths' work has to be carried further before we come to definite conclusions. Second, congenital difficulties, hypoglycemia and asphyxia, most frequently occur in the prenatal child. Congenital difficulties are beyond therapeutic control, and they may be genetic in origin. However, it is interesting to note that Wagner has found there is a great increase in number of congenital anomalies in the true juvenile diabetic patient. Hypoglycemia may be a serious complication in the neonatal period. It may be due to a maternal over dose of insulin or to an over production of fetal islet tissue. Asphyxia in a diabetic child is a real problem, and it is to be feared greatly if the patient has had prolonged labor due to the large size of the baby. Furthermore, insulin is capable of producing cerebral edema. Last, and most important, is the fact that the alkali reserve, measured by the plasma combining power, is lower in the diabetic offspring than in that of the non-diabetic. It certainly remains for the diabetic mother to make more frequent calls to her physician during her pregnancy. It must be impressed upon her that she should be checked more often the first three months of her pregnancy because of nausea and vomiting, with re-adjustment of her diet, in order to prevent spontaneous abortion. Possibly the use of hourly feedings of carbohydrates, or the use of 5% glucose by rectum, or the use of 5% to 10% glucose intravenously, may be necessary. During this period the mother's urine should be tested every two to six hours, and the necessary amount of insulin should be given accordingly. If nausea and vomiting do not occur in the first three months, the patient's regime should be carried on as formerly. In the second three months we are interested especially in the low renal threshold and the increased requirements for food. Here the amount of insulin must be changed according to blood sugar estimates alone. In the beginning of the last three months, acidosis must

be watched closely. By this time the basal metabolic rate is increased perhaps 20%, and a definite caloric intake is necessary. The baby needs 50 grams of glucose daily, and the administration for this has to be made in the patient's diet. Labor, also, increases the characteristic changes of the last three months, namely the elevated metabolism and the depletion of glycogen. If normal labor is selected, the patient requires constant attention because she is a potential coma case. As a rule 150 to 300 grams of carbohydrates introduced by some method and insulin determined according to the blood sugar and urinalysis are absolutely necessary. If Caesarean section is chosen there is no special danger of acidosis, but there is the danger of hypoglycemia. Therefore, the blood sugars must be watched carefully again, preferably maintaining them between 150 to 200 mgs. per 100 cc. of blood. This patient must be treated as any surgical case with urinalyses, blood sugars, and insulin accordingly every three hours following the operation. Failure of normal lactation is another characteristic of the diabetic mother. This is due, possibly, to the lack of oestrin, or the specific lack of lactogenic hormone of the pituitary gland. This failure does not appear to develop by diet because it has occurred when patients have received as high as 3,000 calories.

Therefore, within the last year the problem of diabetes has extended from the life of the internist to that of the dermatologist, pediatrician, surgeon, and obstetrician. Our diabetics are living longer; consequently, they are gradually entering into fields other than that of the internist.

Eli Lilly & Company made this investigation possible by graciously furnishing the protamine.

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Discussion

DR. R. T. LA VAKE: This has been a very interesting paper. My practical experience in diabetics associated with pregnancy has been limited to four cases. The responsibility rests upon the obstetrician to recognize these cases immediately. They should then be referred to the internist for treatment.

In spite of everything that could be done in two out of the four cases that I spoke of, they went into coma and aborted. It seems to me that it cannot be too strongly emphasized that the treatment of diabetes is so complicated, that the obstetrician should not attempt to take care of these cases without the assistance of the internist.

DR. R. SWANSON: I would like to ask Dr. Beard a few questions. He did not mention sterility in diabetic women.

Isn't the pancreas of the fetus supposed to carry the diabetic woman to term?

Caesarian section is as yet not the accepted method of treatment for diabetics in this section.

DR. A. BEARD: Before the days of insulin many of our diabetic women were sterile. With the use of insulin diabetic women, being normal in growth and development, are beginning to take their place along with normal women. We see this quite frequently in our dispensary.

The question of whether or not the pancreas of the fetus is able to carry the mother through is a great problem. The fetus has enough to do to take care of itself, and it does not have enough insulin available in its small gland to take care of the mother. This is the time when the mother might go into acidosis. That varies from day to day as time goes on, and it is for that reason the mother must be seen often.

In regard to Caesarian section in the diabetic mother, I do not feel it is necessary to consider it except in certain instances where a mother has a small pelvis and has a large child, and the possibility that she may go into protracted labor. At the present time there is no reason from the diabetic side of the

picture, if the patient is watched carefully, why she should have a Caesarian section in every instance.

SHALL I RAISE MY BOY TO BE A DOCTOR?

EDWARD DYER ANDERSON, M. D.

Summary

In this paper the author discusses the factors which, to his mind, make the practice of medicine at the present time an attractive career for his son. He then outlines what changes he feels will come in the practice of medicine in the coming years and what medicine as a career will offer to a young man. His conclusion is that regardless of the probable changes which will occur, medicine will still be an interesting worthwhile and attractive career.

LAWRENCE R. BOIES, M. D.

Secretary.

NORTH DAKOTA MEDICAL BOARD OF REGISTRATION DOCKET OF CASES: 1936

CASE No. 1: This person had been practicing medicine in this state during 1935 and 1936, although his license had been previously revoked by the Board. An investigator was employed, proceedings had with state's attorney, and joint meeting held of local doctors in that area: Result, man left the state.

CASE No. 2: Started to practice first as a faith-healer, then added medicine. Has now agreed to abandon the practice of medicine.

CASE No. 3: Practiced under the all-embracing title of naturopath, and obtained some following in that village. Has now left the state.

CASE No. 4: A midwife and irregular practitioner. State's attorney investigated and intervened, with result that the woman promised to cease operations.

CASE No. 5: A regular medical doctor, but picked his town and started work without first receiving the state license. Matter taken up by attorney, and the man agreed not to practice further until receiving his legal license. (The Board has at times been confronted with the problem of having to deal with not only the above type of case, but also those cases where some regularly-licensed physician or group of physicians bring in a man and permit him to start to work before first receiving the state license. Then again there is the man, yet non-licensed, but intending to settle in this Land of Goodly Promise and Wealth; who is even perhaps married, and who perhaps buys an interest in a practice, or possibly a drug store and a home, who, when called upon by the Board for his misdemeanor, puts up the heart-breaking plea that he has invested his all in that given town, and that he should be allowed to continue practicing until he has taken the state board examination, even though he is not at all certain that he can pass.)

CASE No. 6: A flamboyant follower of the Glass system. Arrested and bound over to the District Court for practicing medicine.

CASE No. 7: At another town. Some activity by an irregular, not classified under the title of those working under another type of board. Investigation by the local physicians requested.

CASE No. 8: This should be docketed under the heading of plurals. In one of the larger towns of the state. To a great extent the outcome will depend upon the interest and the activity of the regular physicians of that town.

CASE No. 9: A faith-healer, with a very large following and a lucrative return. Does not directly prescribe medicine, although advocating certain drugs. Under investigation.

CASE No. 10: Tried and convicted of murder in second degree, due to an alleged operation. Yet on appeal.

CASE No. 11: A person bearing different names. Arrested on charge of criminal abortion. Bound over for trial.

CASE No. 12: A woman. Alleged that she was operating a hospital and administering drugs, although not even a registered nurse. To date, not sufficient evidence to initiate proceedings.

CASE No. 13: A combination group of so-called naturopaths, advertising and practicing medicine. Upon action, left town.

CASE No. 14: Complaint made that this osteopath was practically doing general medical practice. Under investigation.

CASE No. 15: Hearing heard for revocation of license. See final paragraph of this paper.

CASE No. 16: A decided irregular, in the limelight for some time. Was convicted some years ago for violating the Medical Practice Act. Very much in evidence during legislative sessions. Now under investigation.

CASE No. 17: Small-town irregular practitioner. Has recently moved to a farm. He is going to leave the state.

CASE No. 18: Non-ethical practitioner, but other men in that area suggest he be given a chance to improve, upon warning of his standing.

CASE No. 19: A noted offender, and one who was made to leave Minnesota a few years ago. Charged with using an instrument to procure an abortion, he is now out on bail. An irregular of the worst type.

NOTA BENE

It should be carefully noted that charges based partly on hearsay, cannot in court be admitted as evidence, and under such conditions any endeavor to prosecute and fine or imprison the designated offender entails unnecessary expense upon the Board and might result in the affair's being dismissed by the court. Some attorneys and also some interested physicians are instrumental in defeating well-meant efforts of the medical board to disqualify non-ethical practitioners and also the efforts of the Board to take action in cases of decided violation of the Medical Practice Act. In a recent case wherein the defendant physician certainly seemed to have deserved the complaint alleged against him, and also to have merited the cancellation of the license, the Board considered that it could not act definitely at the time, due to the fact that in the course of the hearings some hearsay evidence was injected into the testimony, thus partly nullifying the Board's proposed action. However, in that case, as some actual evidence was introduced proving non-ethical practice (but not in direct line with the original charges or the wording of the Law) the case may again be opened up. The powers of the Board could be increased through legislative action along the following lines: (1) By increasing the penalty for a second offense of violation of the Medical Practice Act. About two years ago a bill seeking this object was passed, but unfortunately was vetoed by Governor Welford. An illustration of how such a desired bill would work might be cited in the case of a notorious irregular who a few years ago was fined a small amount, plus jail confinement; later arranged with the judge that if released from some of the confinement, he would leave the state. Soon thereafter bobbed up in another part of the state, again under charge for a very serious offense. It was desired by the Board in the original case of that man, to make the charge of obtaining money under false pretenses (which he certainly did), but the presiding judge would permit the lighter charge only, i. e., of practicing medicine without a license. One-town irregulars or those who move from place to place generally get enough money from the gullible public to pay one fine after another.

PROPOSED LAW No. 2: To give the Board greater powers in proceedings to revoke the license of an offending physician or surgeon.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary
St. Paul, Minnesota

DOCKET OF CASES

ILLEGAL LIQUOR PRESCRIPTIONS. The Minnesota State Board of Medical Examiners cautions all physicians against issuing illegal prescriptions for liquor, after appearance before the Board of Mr. William Mahoney, state liquor control commissioner, on November 27, 1936. Commissioner Mahoney reported that a number of physicians had been writing out

hundreds of prescriptions for liquor, and that these particular prescriptions were not issued in good faith. Some were even blank, to be completed by the druggist. Four physicians, two druggists, and one veterinarian were haled before the Board on February 6, 1937. All concerned admitted guilt, and the four physicians were reprimanded by the Board. It is the opinion of the Board that it is not necessary to remind physicians that the indiscriminate issuance of liquor prescriptions is a violation of the law; and all physicians are asked to do their part in living up to this law.

STATE OF MINNESOTA *ex rel* KNUTE H. LUROSS *versus* BASIC SCIENCE BOARD. On February 5, 1937, Judge M. A. Brattland, of the District Court of Polk County, Minnesota, made an order sustaining the demurrer interposed by the Basic Science Board in the action whereby Knute H. Luross attempted to secure a basic science certificate without examination. Judge Brattland gave Luross a stay of 30 days to perfect an appeal to the Minnesota Supreme Court. No such an appeal has been taken. Luross was found guilty in March 1936 of practicing healing without a basic science certificate. He was sentenced to a term of six months in the county jail. This sentence was suspended on the condition that he cease practicing healing until licensed. The Basic Science Board was represented by the then Attorney-General Harry H. Peterson, William S. Ervin, and Roy C. Frank, assistant attorney-generals.

STATE OF MINNESOTA *versus* R. A. McHALE. On March 23, 1937, one R. A. McHale, 38 years old, was convicted of practicing healing without a basic science certificate at Milaca, Minnesota. On March 16, 1937, McHale filed an affidavit of prejudice against Judge D. M. Cameron, of District Court, who promptly referred the case for trial to Judge Anton Thompson, Fergus Falls, who was holding court at Milaca at that time. At the conclusion of this trial, Judge Thompson sentenced McHale to a term of four months hard labor in the Long Prairie jail (Todd County). McHale came to Long Prairie in 1936, setting himself up to be a chiropractor. He examined patients, administered manual manipulation and light treatments, furnished salve and pills for the treatment of diseases. Some patients paid \$2.00 per treatment; others \$10.00. The State of Minnesota was represented by Mr. J. Norman Peterson, county attorney of Todd County; and by Mr. Manley Brist, of St. Paul, who was appointed assistant county attorney of Todd County for purposes of the trial. The Board thanks Mr. Peterson, and Judge Cameron for his prompt reference of the case.

STATE OF MINNESOTA *versus* JEANNE MARTIN, *alias* ESTHER G. MARCOE) TALBOT. On March 5, 1937, one Jeanne Martin, alias Esther (Marcoe) Talbot, 32 years of age, pleaded guilty to an indictment charging her with the crime of abortion. On April 1, 1937, the defendant was sentenced to a term not to exceed four years in the Women's Reformatory at Shakopee, Minnesota. Evidence by the Minneapolis Police Department indicated that the woman had performed in excess of 75 abortions, and that she had been performing abortions for two years. She collected about \$1,500 for this unlawful work. After examination by two physicians, however, it was deemed unwise to incarcerate the prisoner because of her physical condition, although she had done nothing to improve her health prior to her arrest. The defendant was married in 1931 to James Edward Talbot, and the two have been living in Minneapolis under the name of Martin. The woman was placed on probation for four years in charge of the probation officer of Hennepin County, due to her unsatisfactory physical condition. The Board thanks the Minneapolis Police Department for its commendable work in this case.

TO PHYSICIANS OF SOUTH DAKOTA FROM THE BLACK HILLS MEDICAL SOCIETY

Fellow Physicians:

Probably most of the physicians of the state have already visited Rapid City, the convention home for 1937.

To those who have not, we wish to say that your visit here will be more than the usual routine of high-class papers and discussions. We feel that in the Hills we have a certain community of interest that does not exist elsewhere. Our Black Hills region, standing as it does surrounded by a wide plain has certain features all its own, and so has to offer to the visitor something entirely different from anything surrounding it. Our Black Hills Medical Society is limited by topographical rather than geographical boundaries. At the same time each community has something distinctive to offer the visitor, the forests, the mines, the thermal springs, sugar refinery, vast caves, are a few of the many attractions. The convention city itself lies snuggled in the eastern embrace of the mountains and provides hotel facilities unsurpassed by any city of its size in the entire west. The Black Hills are yours; come out and get acquainted with them.

NEWS ITEMS

Funeral services for Dr. Joseph D. Freed, 85, of Goodwin, South Dakota, who died on March 27 at Watertown, were held in Goodwin on March 30.

Dr. George T. Joyce, 58, of Rochester, Minn., was buried on March 31, 1937, in Saint John's Cemetery in Rochester.

Hereafter, the Anoka State Asylum at Anoka, Minnesota, will be known as the Anoka State Hospital, according to Dr. Milburn Watts Kemp, superintendent.

Joyce W. Baldwin, credit manager of the Deaconess Hospital in Great Falls, Montana, has been named first assistant superintendent of the hospital.

Dr. Herbert H. James, of Butte, Montana, was a recent visitor to the northwest sectional meeting of the American College of Surgeons in Seattle, Washington.

Dr. Albert David Brewer, of Bozeman, Montana, has returned to that city from Berkeley, California, where he took a six weeks' course in public health work.

Dr. Albert Harold Reiswig, formerly of Fairmount, North Dakota, is now in practice at Wahpeton, North Dakota, taking over Dr. W. John Pangman's practice.

Dr. Charles E. Lyght, director of the Student Health Service at Carleton College, Northfield, Minn., was recently notified of his election as an associate of the American College of Physicians.

More than 1,600 individuals in Rolette County, North Dakota have been given Mantoux tests, according to Doctor Milton Greengard, of Rolla, head of the county tuberculosis survey.

According to Doctor Emmett Adolph Doles, president of the Hill County Medical Society, Havre, Montana, that city is in danger of a smallpox epidemic unless vaccinations are speedily done.

The South Dakota State Senate on March 2 killed two proposals to permit the State Board of Charities and Corrections to build an additional insane hospital at Watertown.

Dr. Francis Elmo Kibler, a graduate of the University of Colorado School of Medicine in 1933, is now associated with the Austin Clinic at Austin, Minnesota.

Dr. Myron O. Henry, of Minneapolis, was a guest speaker at the meeting of the Park Region Medical Society at Alexandria, Minn., on April 14, 1937.

State Senator Clifford I. Oliver, M. D., of Graceville, Minn., had an article in *The Minneapolis Tribune* on Sunday, April 11, called "Goodbye! Country Doctor"!

Dr. Rudolph John Ferlic, a graduate of the Creighton University School of Medicine at Omaha, Nebraska, in 1935, and a native of Butte, Montana, is in practice at Panama, Iowa.

Bids were opened in St. Paul, Minn., on March 30 for the construction of the new state hospital for the insane to be erected at Moose Lake, Minn. About 600 or 700 men will be employed in the project.

Dr. John S. Burton, who has completed his internship at the Minneapolis General Hospital, has taken over the practice of Dr. Albert William Shaw, of Buhl, Minn., who is retiring after 38 years of practice.

Dr. Ernest J. Hofer, of Freeman, South Dakota, a graduate of the University of Illinois College of Medicine in 1932, has established practice at Iroquois, South Dakota.

Dr. Paul Reed, of the Minneapolis General Hospital, a graduate of the University of Minnesota School of Medicine in March 1936; will associate with Dr. Victor A. Mulligan at Langdon, North Dakota.

Dr. Bernard S. Clark, formerly of Lead, South Dakota, a graduate of the Washington University School of Medicine in St. Louis, Missouri, is now in practice in Spokane, Washington.

Robert M. Catey, son of Mr. and Mrs. William Catey, of Mobridge, South Dakota, took his degree in medicine from the University of Chicago on March 16, 1937. He will interne at a Chicago hospital.

A \$75,000 hospital is hoped for in Malta, Phillips County, Montana. Citizens are trying to induce the board of county commissioners to issue \$40,000 in bonds, and to obtain \$35,000 as a WPA grant.

Dr. Julio Raymond Soltero, of Lewistown, Montana, has been named health officer for Fergus County to replace Dr. John C. Dunn, who now heads the state hospital at Warm Springs.

Dr. William Wallace Holleman, of Corsica, South Dakota, a graduate of the University of Illinois College of Medicine in 1933, will open a new hospital in Corsica.

Dr. Louis William Allard, of Billings, opened a two-day free clinic for crippled children under 16 years of age at Saint James Hospital in Butte, Montana, March 15 and 16.

Dr. W. A. Fansler, Minneapolis, read a paper entitled "Carcinoma of the Rectum and Colon" before the Mount Powell Medical Society, Butte, Montana, April 30.

Doctor Christopher Roy Dukart, of Richardton, North Dakota, has gone to Chicago, Illinois, for post-graduate work. Doctor Dukart's practice is being carried on temporarily by another physician.

N. E. Davis, of Columbus, Ohio, secretary of the National Board of Hospitals of the Methodist Episcopal Church, recently inspected the Methodist State Hospital in Mitchell, South Dakota.

United States Representative Fred Hildebrandt, of Watertown, South Dakota, has introduced a bill into Congress which would authorize construction of a 100-bed hospital for veterans in Eastern South Dakota.

The Veterans' Administration at Washington, D. C., will open bids on May 11 for the construction of a new surgical unit at Battle Mountain Sanatorium at Hot Springs, South Dakota.

The American Medical Golfing Association will hold its twenty-third annual tournament at beautiful Seaview Country Club, Atlantic City, New Jersey, on Monday, June 7, 1937.

Louis William Shodaire, Los Angeles, California, has donated to the Montana Children's Home at Helena, cash and real estate to the value of \$200,000 to be used for the construction and operation of a hospital for crippled children.

Heart disease took 141.1 persons per 100,000 in North Dakota in 1932 and 1934; and cancer was second with 76.1 persons per 100,000 population, according to J. M. Gillette, Ph. D., professor of sociology in the University of North Dakota.

Dr. Walter F. Muir, a recent graduate of the University of Minnesota School of Medicine, has taken over the practice of Dr. Lee Bey Greene, Edgeley, North Dakota, who is ill in the Northern Pacific Hospital in St. Paul, Minnesota.

Dr. Kano Ikeda, associate professor of pathology in the University of Minnesota; and Otto Theodore Walter, A. B., M. S., Ph. D., professor of biology at Macalester College in St. Paul, Minn., are in charge of a new course in medical technology to be offered in that institution.

Dr. Stanton Lovre, a native of Watertown, South Dakota, was married to Miss Frances Anderson of Lincoln, Nebraska, on March 25. Dr. Lovre, a graduate of the University of Nebraska College of Medicine in 1936, will open practice at Alma, Nebraska.

Dr. Floyd Coslett, formerly superintendent of the State Sanatorium, Sanator, has accepted a position at West Rutland, Mass., in the Veterans' Hospital. Dr. T. L. Havlicek, assistant at Sanator has gone to Denver to act as regional director in the Veterans' Hospital there.

Doctor Otto William Yoerg was elected president of the Minneapolis Surgical Society on March 4. Doctor Edward A. Regnier was elected vice president; Doctor Harvey Nelson was chosen secretary-treasurer; and Doctors Daniel A. MacDonald and William A. Hanson were selected as executive council members. Membership in this body is limited to 50.

Bids were accepted on April 10 for a new \$40,000 hospital at Wolf Point, Montana, to be operated by the Trinity Hospital Association. It will be of fireproof face brick, steam-heated, with terazzo and asphalt floors, and will contain a freight elevator.

Dr. J. Vincent Sherwood, of Doland, South Dakota, a graduate of the University of Minnesota School of Medicine in 1929, is the new superintendent of the South Dakota State Tuberculosis Sanatorium at Sanator, South Dakota.

Dr. Frank L. Watkins, city health officer of Great Falls, Montana, and health officer of Cascade County, announces that 379 children in the county outside of those in the Great Falls High School, have been given Mantoux tests.

Dr. John C. Dunn, of Lewistown, Montana, a graduate of the Northwestern University Medical School in 1902, has been named Acting Superintendent of the Warm Springs State Hospital by Governor Roy E. Ayers.

Custer County in South Dakota has a new nurse, hired for a period of 3 months, commencing April 1. Funds were secured from the South Dakota State Board of Health, Custer County commissioners, and from the sale of Christmas seals.

Bids will be opened early in May for a \$90,000 children's preventorium to be erected at Wausau, Wisconsin. It will have a capacity of 20 beds. (See "The Willard Bequest," by Hoyt E. Dearhart, M. D., in THE JOURNAL-LANCET, April 1937, p. 138.)

Dr. Royal V. Sherman, a graduate of the University of Minnesota Medical School in 1931, will join the Northwestern Clinic at Crookston, Minn. He formerly was associated with the Bratrud Clinic at Thief River Falls.

John Barton, vice-president of the Northwest Security National Bank of Madison, has been named treasurer of the South Dakota section of the American Society for the Control of Cancer by Dr. Clarence E. Sherwood, of Madison.

Dr. Hugo Mella, of the Veterans' Administration Facility at St. Cloud, Minn., announces the appointment of Dr. James S. Grotfelty, of Clarinda, Iowa; and Dr. Harold Lawn, formerly of Ely, Minnesota, as associate physicians at the veterans' hospital.

Dr. George E. Cardle, formerly of Ah-Gwah-Ching, Minn., will take over the practice of Dr. Earl F. Jamieson, of Brainerd, while Dr. Jamieson is in Chicago for a postgraduate course in ophthalmology and otolaryngology at the University of Illinois College of Medicine.

The Montana State Board of Medical Examiners has licensed these physicians: Dr. S. S. Graff, of Butte; Dr. W. C. Robinson, of Cutts, Alberta, Canada; and Dr. Wayne Gordon, of Billings. Drs. Rowland G. Scherer, Bozeman; Orval A. Bosshardt, Lyman, Wyoming; Paul R. Ensign, Butte; Harry G. Drew, Albion, Nebraska; Earl H. Brown, of Lewistown; and James S. Gravly, of Butte, received reciprocity diplomas.

Dr. Charles T. Granger, Rochester, Minn., county physician for Olmsted County, has published *Auld Lang Syne*, a book of 5 short stories. One of them, "The Saga of a Country Doctor," appeared as a serial in The St. Paul Pioneer-Press.

South Dakota physicians were grieved to learn of the death of Dr. Milber Brink, 86, at Boyden, Iowa, during March. For many years Dr. Brink owned lands in Walworth County, South Dakota; and for a time he owned the Bank of Granville in South Dakota.

Doctor Fred Floyd Keene, Doctor Jesse Walter Foster, and Doctor E. A. Hofer conducted a scarlet fever clinic on March 5 for the students of Wessington Springs, South Dakota, in collaboration with Superintendent of Schools Barrett Lowe, of Wessington Springs.

A campaign for \$10,000 for the Methodist State Hospital at Mitchell, South Dakota, has been announced by Reverend P. O. Bunt, executive secretary of the hospital's board of directors. No such campaign has been made since 1918 by this hospital.

Dr. Hovold K. Helseth, Litchville, North Dakota, a graduate of the University of Minnesota Medical School in 1930; and Dr. Carl A. Eckhardt, formerly associated with Dr. Arthur F. Bratrud, of Minneapolis, have associated with Dr. Edward Bratrud, of the Bratrud Clinic and Hospital in Thief River Falls, Minn.

Dr. Paul W. Giessler and Dr. John F. Pohl, recently of Boston, Massachusetts, have established partnership at 1945 Medical Arts Building in Minneapolis. Dr. Giessler was graduated from the University of Minnesota School of Medicine, where he is associate professor of orthopedic surgery in 1913; Dr. Pohl in 1929.

Dr. Frank Woodford Stevenson, of the Midwest Clinic at Rapid City, South Dakota, was married on March 6 in Minneapolis to Miss Esther Arndt, of Minneapolis. Dr. Stevenson is a graduate of the University of Minnesota and Rush Medical College of the University of Chicago.

On May first, Montana will wage war on gophers, marmots, and other rodents in an effort to stamp out the bubonic plague, according to Dr. William F. Cogswell, Helena, secretary of the State Board of Health. The Federal government has supplied \$3,000 for a truck, laboratory, and equipment.

Montana physicians are mourning Dr. Harris A. Bolton, superintendent of the Warm Springs State Hospital, who died on March 18. Dr. Bolton came to Montana in 1911, shortly after his graduation from the Baltimore College of Physicians and Surgeons. In 1929 he was named to the position he held at his death.

On April 5, President John A. Evert, President-elect William Smith, and Secretary E. G. Balsam, of the Medical Association of Montana, visited the Murray Clinic in Butte on the occasion of the clinic's 30th anniversary. Next day the three physicians visited Warm Springs, Galen, Deer Lodge, and Anaconda, all in Montana.

Dr. William F. Cogswell, Helena, Montana, secretary of the Montana State Board of Health, returned on April 14 from Washington, D. C., where, with Dr. Albert J. Chesley, secretary of the Minnesota State Board of Health, he attended a conference on social security.

Hillard Herman Holm, M. D., city health officer of Glencoe, Minnesota, and a graduate of the University of Minnesota Medical School in 1919, has a case of his described in the April issue of the Des Moines magazine, *Look*. Doctor Holm separated what the press called "Siamese twins" (xiphopagi) in 1927, the operation being a success, although one member died in March, 1936.

The radio schedule of the Minnesota State Medical Association for May (WCCO: 810 kilocycles) is at 9:45 a. m. every Saturday morning. Subjects, by Dr. William A. O'Brien, are as follows: May 1, "Child Health Day"; May 8, "Minnesota State Medical Association"; May 15, "Some Major Health Problems"; May 22, "Nervous Exhaustion"; May 29, "Artificial Dentures."

The annual spring clinic of the Yellowstone Valley Medical Society will be held May 3rd in Billings, Montana. President John A. Evert, Glendive, head of the Medical Association of Montana, will be a guest; and Dr. George Wilkins Swift, of Seattle, Washington, will speak. Dry clinics and fracture films will be shown in the morning, while local members will read papers in the afternoon.

The Annual Address in the University of Minnesota Cancer Institute Lectureship will be presented by Dr. Robert S. Stone of the University of California, on Tuesday evening, May 4, at 8:15 p. m. in the Medical Sciences Amphitheater. The title of Dr. Stone's lecture will be "Theoretical and Practical Considerations of Super-voltage X-rays, Neutrons and Artificial Radio-active Substances for Treatment of Cancer."

Alumni of the Johns Hopkins University School of Medicine at Baltimore, Maryland, held their annual meeting at the Minneapolis Club in Minneapolis on Saturday evening, April 10, 1937. Johns Hopkins alumni from Iowa, Minnesota, North and South Dakota, and Western Wisconsin were in attendance. Between 40 and 50 were present. The meeting was addressed by Alan Mason Chesney, M. D., Sc. D., associate professor of medicine and dean of the Johns Hopkins School of Medicine. A talking film of the late William H. Welch, M. D., was shown.

On April 7, Dr. J. A. Myers addressed the Post-Graduate Conference of the Wayne County Medical Society in Detroit, Michigan; on April 12 the Convocation at the University of North Dakota, Grand Forks, the District Medical Society and the Business and Professional Women and Parent-Teachers' Association; on April 15 the Camp Release Medical Society at Dawson, Minnesota; on April 20 the annual meeting of the Illinois Tuberculosis Association, Rockford, Convocation of Rockford College, and the Winnebago County Tuberculosis Association.

Major General Frank T. Hines, administrator of the Veterans' Bureau in Washington, D. C., has advised Secretary of State Goldie Wells that South Dakota will "receive careful consideration" in the development of any future construction program for war veterans' hospitals; but that all available funds have already been specifically allocated.

BOOK NOTICES

HANDBOOK ON OTOLARYNGOLOGY

Physical Therapeutic Methods in Otolaryngology, by ABRAHAM R. HOLLENDER, M. D.; first edition, heavy cloth, gold-stamped, 442 pages, 189 illustrations; Saint Louis, Missouri: The C. V. Mosby Company: 1937. Price, \$6.00.

This useful handbook follows the symposium plan, wherein the greater part is the work of the author, himself widely experienced in physical therapeutic measures in otolaryngology; and the rest contributed by 10 well-known specialists who have devoted special attention to the subjects assigned to them.

As stated in the preface, the main body of the book considers the clinical problems encountered in everyday practice. Only a small portion is given up to the fundamentals, for such readers as must acquire a grounding to insure correct employment of the various therapeutic aids.

From the foregoing it will be seen that the aim of the book is essentially practical, to furnish the accepted procedures of physical therapy as an adjunct to the use of routine and other treatment in otolaryngology. It bears all the evidence of usefulness in this direction, evaluating and adjusting the various tried and adopted measures to the special field under consideration. It should prove very helpful to those who want the facts quickly furnished in practical form.

The chapter on hearing aids is contributed by HORACE NEWHART, M. D., of Minneapolis, and is a model of terseness and completeness, giving an outline of all essential information, with the authority of one who has devoted much thought and study to the subject, and who is well-recognized everywhere for his authoritative standing in that field of his work.

While the volume is intended primarily for the practical use of the specialist, it is one which can be read profitably by any practitioner. One needs to know about these things, if only to furnish a working knowledge for intelligent discussion. The book can be cordially recommended.

GILBERT COTTAM, M. D.,
Minneapolis, Minn.

ZONDEK ON THE ENDOCRINES

Diseases of the Endocrines, by HERMAN ZONDEK, M.D.; 3rd edition, revised, translated by CARL PRAUSNITZ, M.D., blue cloth, gold-stamped, 492 pages, 168 illustrations; Baltimore: William Wood & Company: 1936. Price, \$11.00.

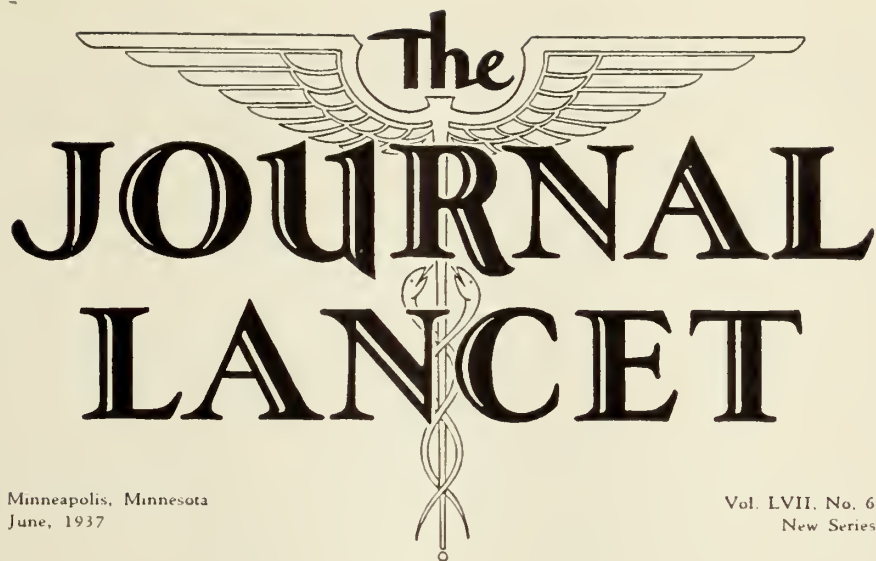
Endocrinology is becoming increasingly important to the general practitioner. This volume represents the current translation of the author's book, and follows on general lines the last German edition which appeared in 1926. The present edition was prepared and concluded in England.

The recent advances in the knowledge of the physiology and pathology of internal secretions are accounted for, and essential points are altered when necessary. The author supplements the known clinical data with his experience. Although this subject still contains much unexplored territory, the author correlates the advances already made and consolidates them so that this volume remains a book for the clinician. The subject matter is arranged according to diseases.

A number of fundamental hypotheses, some of which were derived from the author's personal work, are contained in the book, and give it its special outlook. This edition is a most important contribution to the science of endocrinology. It should be noted, however, that the author is HERMAN ZONDEK; not the somewhat more famous BERNHARDT ZONDEK of the ASCHHEIM-ZONDEK test.

HILBERT MARK, M.D.,
Saint Paul, Minnesota

The JOURNAL LANCET



Minneapolis, Minnesota
June, 1937

Vol. LVII, No. 6
New Series

The Schilling Hemogram In Acute Infections

W. H. Griffith, M.D.*
Huron, So. Dak.

THE treatment of acute infections constitutes a major portion of the work in nearly every field of medicine. Therefore, anything which will aid in the management of these cases should be of interest to the specialist as well as the general practitioner. Every acute infection is a struggle between the infectious process on one hand and the defensive forces of the body, on the other hand. It is important to know at all times just how this struggle is progressing, and the relative strength of the opposing forces.

In mild cases, the clinical picture may give all the information that is needed, but in the more severe cases we must use every possible means to follow the progress of the disease so that we may have a proper basis for therapy and prognosis.

Routine leucocyte and differential counts have been the most common laboratory examinations in acute infections but they do not tell the whole story. At times they may even be misleading. During recent years there has been a great deal of interest in a modified differential count called the Schilling hemogram. It is claimed that it is possible by this method to differentiate between a normal blood, a moderately severe infection, and an infection that is likely to have a fatal outcome. Furthermore, it is claimed that examinations of the blood from day to day give the most accurate picture of the progress of the case. Hundreds of articles have been written about the Schilling hemogram, nearly all of them attesting its value; but still it is slow in coming into general use.

This may be due to a natural skepticism on the part of those who have not had first-hand contact with the

work, and also to some confusion resulting from numerous modifications, and variations in terminology.

Sometime ago we began an attempt to evaluate the Schilling hemogram for ourselves by comparing the conclusions from the blood findings with the later developments in each case. We now have records of 923 examinations in 625 cases, covering a wide range of conditions. (All cases are from the private practice of the members of the staff of the Huron Clinic.) This series, although not large, has been sufficient to convince us that the Schilling hemogram should be made a part of the examination in every case which is serious enough to warrant careful study.

It was thought that a brief review of the subject together with some reference to our own impressions might be of interest.

The work of Schilling was based on observations of Arneth published in 1904¹. It had been known that acute infections usually stimulate the formation of new leucocytes, or at least, that they increase in numbers in the blood stream. Arneth believed that these new cells could be identified by their appearance and that the proportion of new cells was of greater significance than the total number of leucocytes. The increase in cells is principally in the polymorphonuclears and so Arneth devoted his attention to them. He believed that the age of a polymorphonuclear neutrophile was indicated by the degree of lobulation; *i. e.*, the number of segments in the nucleus. On this basis he divided these cells into five groups. In Group I he placed those having a sausage-shaped or irregular nucleus all in one segment. In Group II he placed those with a nucleus with two segments, and so on. Some hematologists have objected

*From the Huron Clinic, Huron, South Dakota.

to the idea that a cell with a bi-lobed nucleus is necessarily younger than one with three lobes²; but there can be no denying the fact that the cells in Groups I and II become relatively increased in infections. Arneth tabulated his groups from left to right on the page, and so an increase in the first groups, *i. e.*, the more immature cells, has come to be spoken of as a "shift to the left."

Schilling³ attempted to simplify the Arneth count, using a slightly different classification of cells, and placing more emphasis on differentiation of the types of immature forms. He divides the neutrophils into true principal groups, the segmented and the non-segmented cells; *i. e.*, the mature and immature forms. The Schilling index is simply the ratio of the number of cells in these two groups. In normal blood it is a small fraction; that is, there are several times as many mature lobulated cells as there are immature non-segmented ones. With the development of an infection this ratio changes promptly and profoundly. For instance, in an acute otitis media or an acute appendicitis of only a few hours duration, the non-segmented or immature cells will have increased until they may be equal in numbers to the segmented ones. With the two types in equal numbers, the ratio will be 1 to 1 and we say the Schilling index is 1. If the infection progresses, the index will rise to 2 or 3 and in overwhelming infections such as septicemia, peritonitis or meningitis, it will rise to 5 or 10 or even higher. It may be well to point out here that the Schilling hemogram is a complete blood study using the methods of Schilling, while the Schilling index is the ratio of segmented to non-segmented cells, and is only a part of the complete hemogram. The Schilling index is practically the same as the staff count and the filament, non-filament count.

With the more severe infections, we have several types of immature cells appearing and they are of great significance. The first is the myelocyte, exactly the same cell that we find in myelogenous leukemia. The second type is the juvenile, which corresponds to the meta-myelocyte of some authors. It has a U-shaped or twisted nucleus with open, less dense structure than that of the mature cells. It is intermediate between the myelocyte and the next type, the staff or stab cell. The stab cell differs from the mature segmented cells only in that its nucleus is all in one segment. The stab cells are the first to increase. In fact, a small rise may occur with such non-infectious conditions as ruptured ectopic pregnancy or intestinal obstruction, severe pain, or even faradic stimulation⁴. The presence of a leucocytosis with only a slight increase in stab cells serves a valuable aid in distinguishing such conditions from acute inflammations.

The appearance of juveniles and myelocytes in the blood is of such significance that another index has been proposed, making use of them. This is the lethal index⁵, the ratio of myelocytes to segmenters, or if there are no myelocytes, then the ratio of half the juveniles to the segmenters. When this index reaches one, and the Schilling index is 4.5 or more, it is said to point to a fatal outcome within about 48 hours. We have had only five cases in which the lethal index reached 1 or higher. All

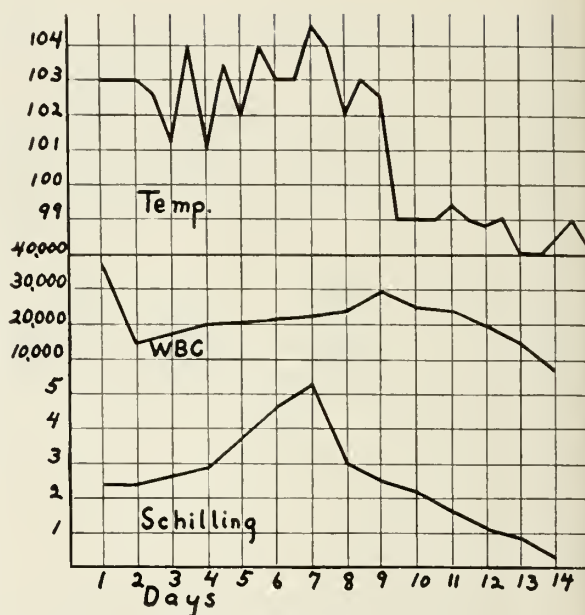


Figure 1. Pneumonia With Recovery. The chart shows the course of the temperature, leucocyte count, and Schilling Index during the course of the illness. The Schilling Index rose until the crisis, after which it dropped sharply, while the white blood count showed comparatively little change.

have terminated fatally although not all within 48 hours.*

We may now consider briefly the usual blood changes in some of the more common forms of illness. Pneumonia serves well to illustrate the relative significance of the leucocyte count and the Schilling index. Chart I shows the course of the temperature, daily leucocyte count, and daily Schilling index in an uncomplicated pneumonia in a boy of six, admitted to the hospital two days following the onset. Note that the variations in the white-cell count have little relation to the course of the disease, while the Schilling index rises steadily until the time of the crisis, after which it drops sharply. Of course, the greater the rise, the more unfavorable is the prognosis, especially when accompanied by a large proportion of myelocytes. A failure of the index to drop with the crisis, or a secondary rise would indicate some complication.

Case 2 is a pneumococcus meningitis, type 3, in a child of four years. The first blood examination indicated a severe infection. The next two showed the condition becoming worse while the fourth showed a temporary improvement. The fifth examination showed a marked turn for the worse although there was little change in the clinical picture. The child died about thirty-six hours later. In these virulent infections it is not unusual to find a marked change in the blood picture, with little apparent cause, only to have the patient's general condition show a decided change within a short time.

The next case, Case 3, is an example of an extremely virulent infection with low resistance. It is a peritonitis

* Since this was written we have seen two cases recover, although the blood picture in each had indicated a bad prognosis. Both were patients with streptococcus infection and were treated with prontisol. We believe this to be of some significance.

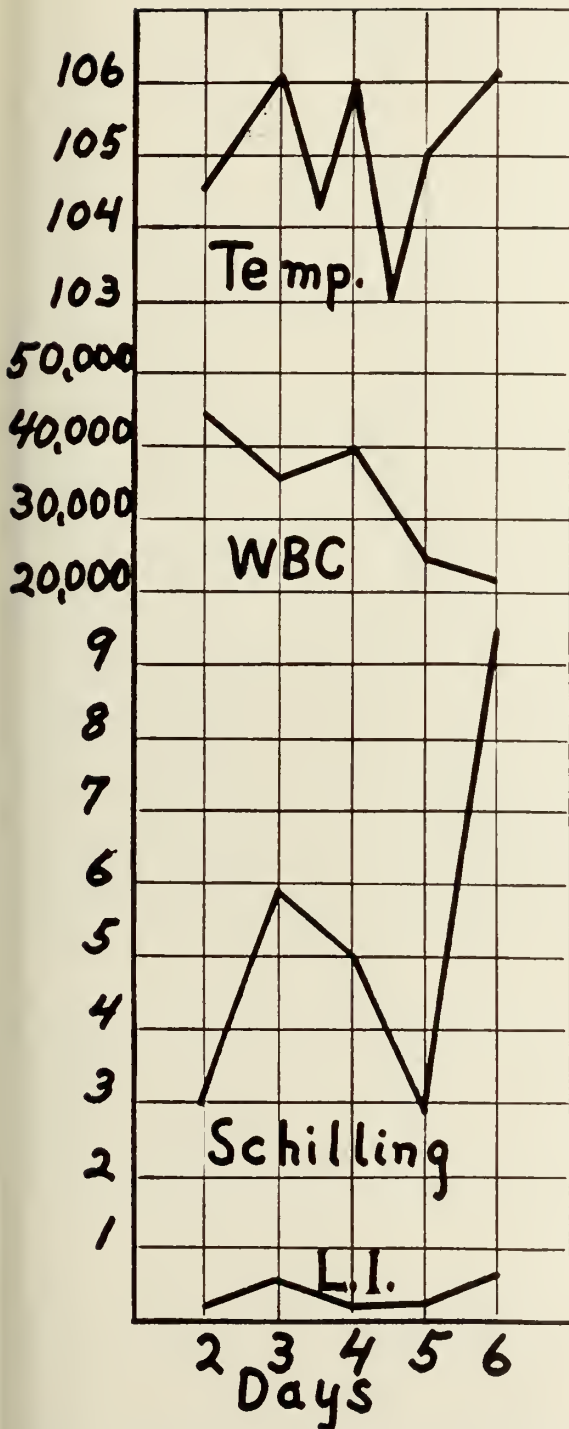


Figure 2. Meningitis Due to Pneumococcus Type III, With Fatal Termination. The temperature, leucocyte counts, Schilling Index and Lethal Index are shown. The patient received anti-pneumococcus serum containing heterophile antibody. This may account for the temporary improvement shown from the third to the fifth days.

secondary to a perforated duodenal ulcer. Only a miracle could save a patient with a blood picture like that found on the last two examinations. His general condition although far from good, would have led one to

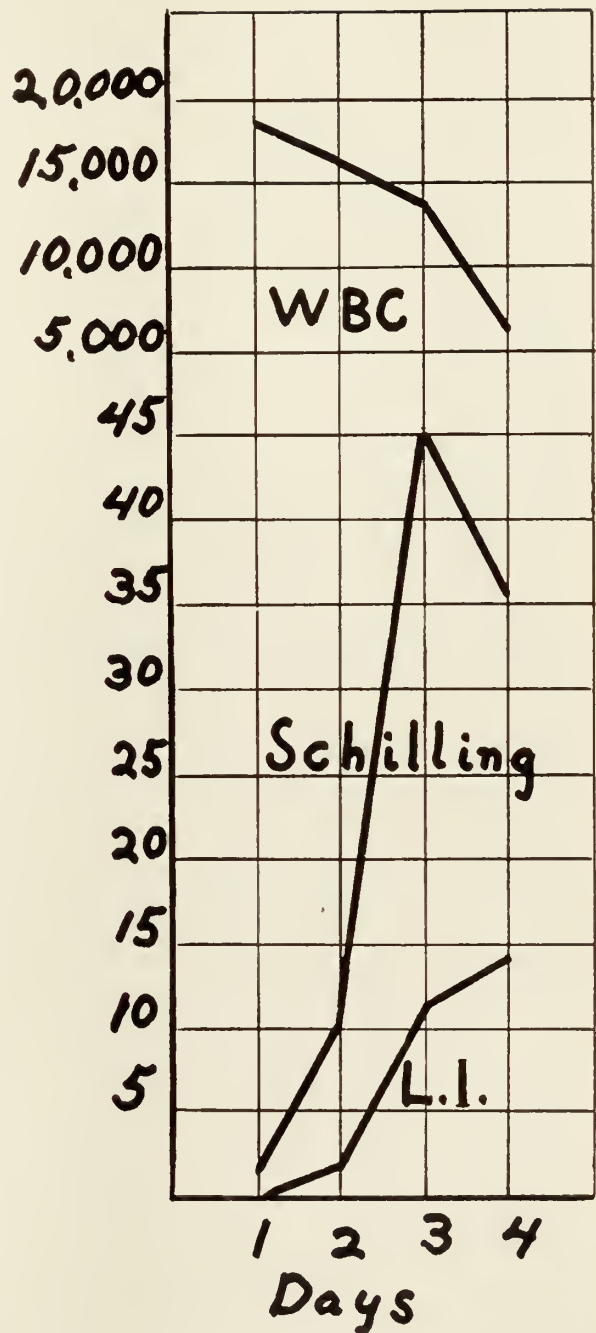


Figure 3. Peritonitis Following Perforation of Duodenal Ulcer. The blood picture on the second day gave a bad prognosis which became more certain on the following days.

believe that he had some chance of recovery.

Case 4 is typhoid in a girl of eight years. It is of interest because it shows a high Schilling index accompanied by the usual low white count, and the Schilling rose as the white count dropped. The leucocytosis in the later stages was due to a pyelitis.

We have been particularly interested in the blood findings in acute otitis media and mastoiditis. Our series includes sixty-two cases. Most of them had several blood

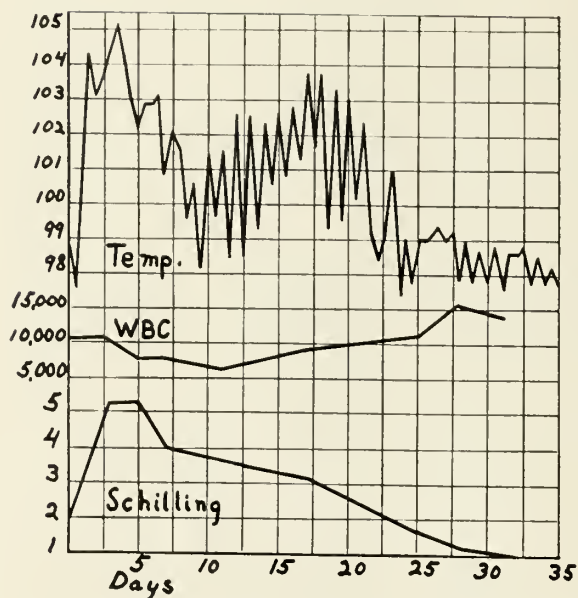


Figure 4. Typhoid Fever. The Schilling Index rose to a fairly high level as the characteristic leucopenia developed and the disease progressed. During the stage of recovery the index dropped gradually and the white cell count rose.

examinations and all had at least one X-ray. I shall not attempt to analyze them except in a general way. It must be remembered that the hemogram is a measure of the virulence or activity of an infection rather than of the amount of mastoid involvement. The onset of the otitis in most cases was rapid. In many of them the first examination showed evidence of a fairly severe infection, and in some, the X-ray already showed evidence of involvement of the mastoid. Under treatment, most of them subsided into a relatively sub-acute stage, although the invasion of the mastoid might continue. The temperature, leucocyte count and Schilling all were usually lower during this period. A failure of the Schilling index to drop would naturally be further indication for surgical treatment, if the clinical and X-ray findings pointed that way. The same would be true of a secondary rise in the Schilling index later in the course of the disease. The blood findings are of great value in judging the importance of complications which may develop. Such conditions as septicemia, sinus thrombosis, brain abscess, or meningitis, will immediately produce a blood picture characteristic of such severe infections.

Acute sinus infections will show some shift in the Schilling hemogram. Sub-acute or chronic infections, and in fact, all important focal infections will show a rise in the Schilling index usually with some increase in large lymphocytes, and no leucocytosis. The hemogram

may aid in determining the importance of focal infection in individual cases.

No discussion of this subject would be complete without some mention of acute appendicitis. In eighty-five cases we have had the opportunity of comparing our blood findings with the evidence of infection shown in the microscopic sections of the appendix. Four cases had normal Schillings and showed no acute inflammation in the appendix. Twenty-two showed a slight elevation. About half of these had normal appendices and the rest showed sub-acute inflammation (as shown by the finding of only a few scattered polymorphonuclears in the appendix) with three exceptions to be noted.

Of the forty-nine with high Schillings, all but one showed acute inflammation. The most pronounced discrepancy was in the three cases where the blood showed evidence of only slight infection and the appendix was found to be gangrenous. Similar experience had been noted by Crocher and Valentine, and it seemed like more than a coincidence. One possible explanation is that the gangrene is due, not to a different type of infection, but to the more or less accidental occurrence of thrombosis of blood vessels in the appendix. In this way gangrene could be produced by a relatively minor infection and until the infection spread, there might be little systemic evidence of its presence. So it happens that although the hemogram is a big help in the diagnosis of appendicitis, it does not relieve one from the necessity of being constantly on guard against gangrenous appendicitis.

There are numerous other types of infections in which the hemogram is of interest, but the foregoing account may give some idea of the possibilities with this type of examination.

Summary

The Schilling hemogram is a blood study using the methods of Schilling. The Schilling index is an important part of the hemogram. It is concerned with the polymorphonuclear cells, and is the ratio of immature to mature cells of this group. The hemogram gives reliable evidence as to the presence or absence of infection and the virulence of an infection if present. It has important diagnostic and prognostic significance.

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Benefactions of Surgery to Man*

Owen H. Wangensteen, M.D.†
Minneapolis, Minn.

IN A MOMENT of weakness I yielded to the request of Dr. Mann and his committee to give this address, which assumed an obligation I now find it necessary to discharge. Two months and more ago it was easy to promise; now, I find it difficult to pay. Greatly appreciative of the honor owing to my profession in having the accomplishments of surgery included in this series of lectures, I ventured to accept this trust with a duteous but self-mistrustful spirit.

The healing art of medicine, it has been said, is the oldest of all the arts. Hippocrates, the Father of Medicine, referred to it as "the art." In sponsoring this discussion relating to Medical Science and Human Welfare, Sigma Xi obviously places upon medicine the stamp of scientific approval as well. Reverberations of discussions amongst medical men as to whether medicine is art or science may even have reached your ears. We can, however, at the outset, with the greatest candor admit that in the relatively short span of years, during which time medicine could lay any justifiable claim to being a science, only during this time, has palpable progress been made in the healing art. It is to the steady growth of knowledge and science on a broad base and to the more general employment of the scientific method in the solution of its problems that medicine owes whatever distinction it enjoys.

My responsibility in this program is to present the rôle that surgery plays in the treatment of disease. And not lightly do I regard this honor, for, time was, not so long ago, when little of surgery was deemed scientific. Lord Moynihan relates that as recently as 1800 when, following several refusals, a charter was granted the disbanded company of surgeons of London, Lord Thurston is reported to have said in the House of Lords, when the bill had succeeded in the Commons: "There is no more science in surgery than in butchery." To this invective, Mr. Gunning, a surgeon, appropriately replied: "Then, my lord, I heartily pray that your lordship may break his leg and have only a butcher to set it."

Surgery or chirurgery is a derivative of two greek words which literally translated mean hand work or handicraft. A surgeon may then be defined as a manual laborer in a Greek dress. Representatives of the guild of surgeons have not infrequently been rash enough to speak of the art of surgery and one of our distinguished

contemporary votaries has been so bold as to describe surgery, "The Queen of the Arts." Now one need not gossip much in the medical "sewing-circle," the confessional in which the sins of one's neighbor are adequately confessed, to learn that surgeons are not universally held in the high esteem to which we may pretend. Very few institutions of human inventions have departed so little from the original spirit of the founder as the sewing-circle. There, we may find and hear ourselves scornfully described as carpenters and mere technicians. It would perhaps be a little unjust for us to take offense at the reproach implied in this designation, for many of us find, in the artistry of work well done, considerable satisfaction, and we are not sensitive or ashamed over employing our hands in the service of our brains. So, whether a surgeon be a tradesman, an artisan or artist is apparently a matter of divided opinion. It is interesting, however, to reflect that whatever of ancient medicine has lived and proved useful in our day is essentially surgical in origin. Whereas, in the time of Hippocrates, medicine and surgery were one and the same healing art, when we again hear of them after the turn of the twelfth century, surgery has assumed the servant rôle of handmaiden to medicine.

And thus, well into the middle of the seventeenth century we find medical men divided into three groups: the superior physician attended and prescribed for patients and with others of his kind concerned himself over theoretical and abstract philosophic exercises relating to disease but of which they made very few accurate or careful observations and knew in consequence but little. At the lower end of the scale was the barber-surgeon or the surgeon of the short-robe of whose duties the present barber-pole is symbolic. He shaved the monks and bled them usually five times a year. In civil practice when blood had to be shed in the performance of an urgently indicated cutting operation, the barber-surgeon did it. He was wholly unschooled except for the knowledge and skill he acquired in the apprenticeship of his calling. He was usually an itinerant, finding it occasionally more convenient to his personal safety to be at some distance, when the patient did poorly following his desperate acts of mercy. In the middle, between these two groups, equally hated by both was the surgeon of the long robe whose essential duty was that of dressing and treating wounds. Eventually the surgeons strengthened their band by taking into company the barber-surgeons. It is a matter of common admission that in Queen

*A semi-popular lecture sponsored by the Minnesota Chapter of Sigma Xi, illustrated by lantern slides and given at the Northrup Memorial Auditorium, January 31, 1936. Reprinted with permission from the September, 1936, issue of *The Sigma Xi Quarterly*.

†Chief, Department of Surgery, University of Minnesota.



Figure 1. Surgeons were originally blood-letters who shaved the monks, and bled them 5 times yearly.

Elizabeth's time when consultations were held between physicians and surgeons that the latter frequently awaited the decision of the physicians outside the sick room as to whether the service of the surgeon would be needed. Oh, what mockery and deception there was in the ostentation of learning displayed by these pompous pedants, the physicians! Moreover their hypocrisy has been fully avenged in that no tangible good of their deliberations has survived the wreck of time and descended to our day. Little wonder that Sydenham, a more modern Hippocrates, counselled "Don Quixote" as the best text on medicine of his time. When Boerhaave, one of the most illustrious and distinguished physicians of the eighteenth century, died he left behind him an elegant brochure, the title page of which declared that it contained all the secrets of medicine. When the volume was opened, every page except one was blank. On it was written, "Keep the head cool, the feet warm and the bowels open." This legacy of Boerhaave to suffering humanity was the product of blind adherence for centuries to authority influenced only by theoretical philosophical abstractions.

O Clio, Muse of history! May it never again be your duty to record in the annals of medicine that men have disdained the skill of the hand and the observations of the eye as being unworthy of the attention of men of learning. May medicine always remain free from the fetters of tradition and authority and the philosophic exercises of the mind uninterested in ascertaining what is fact.

The Development of Surgery

To attempt to tell you in sixty minutes of how surgery has benefited man through the centuries is admittedly a difficult task. My duty is somewhat lightened, however, in that up until about sixty years ago the chief anxiety of surgery was with the treatment of wounds. In the intervening

years, surgery has emerged from a handicraft concerned with wound management to occupy an important position in the treatment of disease. It is with this latter significant chapter of surgery that we are here concerned. Before reviewing some of the accomplishments of surgery attained by modern methods, let us briefly peep into the common practices prevalent well up toward the middle of the nineteenth century.

Anesthesia and asepsis were unknown. Bacteriology had never been heard of. Of the Hotel Dieu the great municipal hospital of Paris and probably the oldest hospital in existence in the world, J. C. Warren writes:

"In the surgical ward there were, on January 6, 1776, 273 patients, there being but 106 beds in the ward. The walls were soiled with expectorations and the floors with evacuations of the bowels and bladders, as also with blood and discharges from the wounds. The wood-supply and the washing were kept in this ward, and every afternoon there was also an out-patient clinic. There were four rows of beds in a ward 34 feet wide, and the report states: 'It is difficult to maintain the purity of the air on account of the blood and pus that stain the floor, which it is impossible to clean, owing to the crowding of the beds.' (Tenon's Committee)

"In the St. Jerome Ward more operations were performed than in any other ward in Europe. It was placed almost directly over the deadhouse, the odors of which were quite perceptible. This ward accommodated about 20 beds and an out-patient department. The capacity of the hospital was 2,500 beds, but during the cold season as many as 4,800 patients were in the hospital at one time. On the straw beds there were sometimes four or five patients called 'agonisans.' These patients were not only the moribund, but also those whose sphincters were beyond control. These beds were only occasionally wiped with a cloth, and the straw was rarely changed. On extraordinary occasions the patients were placed in tiers one above another, so that some were reached only by a ladder. There were no stoves, the wards being warmed only by the presence of the patients."

How the world has moved on since that day! not only in things medical but in the art of knowledge of sanitation, plumbing, heating, ventilation, architecture, and a score of other matters which bear directly upon the comfort of hospital patients. The growth of science has created wealth, convenience and luxury—much of which we can all enjoy. This picture of a hospital scene was probably not overdrawn and was likely fairly typical of what prevailed where patients were brought together in groups until antiseptic practices revolutionized surgery.

The only operations performed were those of

necessity—to save life and when pain was no longer tolerable, as in the presence of a stone in the bladder. In the cutting for the relief of this disorder, the surgeons of the day had developed considerable proficiency. The bladder would be sounded to make certain of the presence of a calculus. The lithotomist would make an incision in the perineum and in a minute he would exhibit the extricated precious stone. Speed was the primary consideration. Amputation of an injured or mortified extremity was another operation which the surgeons had learned to do with dispatch. The lightning-like swiftness of these men in their work has been the object of constant marvel. I have been told of a surgeon of the pre-anesthetic era who in his rash haste in the amputation of a thigh removed as well two fingers of his assistant and both testes of the patient—all in the space of 26 seconds. Since the time of Ambrose Paré (1552), the employment of the ligature in amputations for the control of hemorrhage had become universal practice. Before, the flow of blood from the extremity had been staunched by the use of heated irons, it being hoped that the arrest of hemorrhage would occur through the clotting of the blood in the seared vessel.

War played an important rôle in the development of early surgery. Crude and imperfect as were obviously the ministrations of the surgeons of this time, their services on the battle field were held in high esteem by kings, generals and soldiers alike. The examples of Ambrose Paré and of Barron Larrey afford striking illustrations of the happy influence which the military surgeon of an earlier day exerted over the minds of soldiers in time of war, inspiring confidence in their leaders and assuring them of greater security and safety when struck down by accident or disease. When the French Surgeon Paré appeared at Metz, the soldiers of Charles V. exhausted by fatigue and hunger, crowded around the great surgeon exclaiming, "We have no longer any fear of dying even if we should be wounded; Paré our friend is among us." And Larrey who accompanied Napoleon through all his campaigns was loved by the soldiers, and Bonaparte declared him the most honest and upright man he had ever known. Larrey must have been a most kind and thoughtful man, yet, perusal of his books affords no description of the untold suffering borne by these men during operative procedures. On one day, he amputated more than 200 limbs upon the field of battle—all without anesthesia. How he and his soldiers must have steelled themselves for such ordeals! More than a century earlier Paré had expressed the opinion that surgery, though perhaps incomplete, had attained a state of perfection, unlikely ever to



Figure 2. When the great Ambrose Paré (1510-1590) finished an amputation, he ligatured the arteries, instead of cauterizing them, as had been done before his time.

be improved upon. Vain man has again, from time to time, uttered such futile and frivolous prophecies, only to be in turn outdone and humiliated by his successors.

Anesthesia

The horror of an operation without the beneficent agency of anesthesia is terrible to contemplate. Very few persons are probably now alive who were eye witnesses to such distressed scenes. The advent of administration of ether for the alleviation of pain, an American invention by the dentist Morton in 1846, was one of the great medical triumphs of all time. At the scene of its first supervised trial at the Massachusetts General Hospital in Boston on October 16, 1846, John Collins Warren, the operating surgeon, on conclusion of the successful experiment, spoke these prophetic words, "Gentlemen, this is no humbug."

Never in the history of medicine has a therapeutic principle been so quickly put into practice. Man had long hoped for such an antidote for pain but it had seemed to be a celestial blessing not to be attained in an earthly existence. Oliver Wendell Holmes, our physician-poet, for whom medical men in particular have an especial affection coined the word anesthesia—without feeling. And so the excruciating pain of operation was steeped in oblivion to remain only upon the scarred memories of sufferers and witnesses. Opposition was encountered to the introduction of anesthesia in Scotland where Simpson in Edinburgh advocated the use of chloroform to assuage the pain of child-birth. Scotch theologians of the stamp of John Knox proclaimed from the pulpit that the pain of child-birth was a punishment to be borne in the spirit of meekness and that the administration of anesthetics was an irreverent attempt to circumvent the mandates of the divine power. Scripture was freely quoted in the support of this contention. It had

been related of Simpson that he would have given both his bible and his Shakespeare for a copy of Oliver and Boyd's fact-containing almanac; yet, he knew his bible, too, and used the same weapon in defense when he referred his opponents to the twenty-first verse of the second chapter of Genesis, "and the Lord caused a deep sleep to fall upon Adam and he slept and he took one of his ribs and closed up the flesh thereof." Simpson eventually triumphed and when Queen Victoria permitted the use of chloroform at the time Prince Leopold was born in 1863 all opposition broke down.

Holmes and Semmelweiss and the Contagion of Puerperal Fever

Considerable impetus was lent to surgery in the development of anesthesia. Patients more willingly sought relief from disorders which threatened life and operations became more frequent. Apart from the obliteration of the pain factor during operation permitting of greater care and deliberation on the part of the surgeon, the results were the same. Wounds suppurated; blood poisoning, erysipelas and hospital gangrene followed the surgeons about and thwarted their every effort. The mortality of even trivial operations was prohibitive. It is related of Sir Astley Cooper, the most celebrated surgeon of his time in London, that when requested by King George IV, that he remove a simple wen from the king's head that his agitation knew no bounds. Cooper's anxiety and fear lest erysipelas should supervene seem scarcely compensated by the baronetcy which the king bestowed upon him as a reward for the successful issue of the operation.

Sepsis was the curse of surgery. The forecast that surgery had reached its zenith was more frequently heard from authoritative persons. Suppuration was apparently a natural and unavoidable sequence of operation. When the evidence of inflammation was limited to the site of operation without the menacing portent of centripetal spread, the appearance of an abundance of yellow exudate was acclaimed as "laudable pus." Nicholas Pirogoff, a Russian military surgeon of many campaigns, who had numberless occasions to feel the futility of his own art in dealing with suppuration was moved to write a dissertation upon "Fortune in Surgery" in which he stated that "the influence of the surgeon, the therapeutic resources and mechanical dexterity are of no importance; the results of an operation are dependent entirely upon chance."

However, even before Pirogoff made this resigned pronouncement, Oliver Wendell Holmes had squarely put the blame upon the doctors themselves—at least as far as the tragedies of suppuration attending child-bed fever were concerned. The disease known as puerperal fever, he said in 1843, is contagious insofar as it is

carried from patient to patient by physicians and nurses. The storm of protest and resentment provoked amongst physicians can be readily imagined. The doctors Hodge and Meigs, professors of obstetrics in Philadelphia, took largely upon themselves the defense of the innocence of physicians in such matters. The denunciations heaped upon Holmes were multiple.

Let us for a minute examine Holmes' seriousness. He said:

"Let it be remembered that persons are nothing in this matter, better that twenty pamphleteers should be silenced, or as many professors unseated, than that one mother's life should be taken. There is no quarrel here between men, but there is deadly incompatibility and exterminating warfare between doctrines. . . . If I am wrong, let me be put down by such a rebuke as no rash declaimer has received since there has been a public opinion in the medical profession of America; if I am right, let doctrines which lead to professional homicide be no longer taught from the chair of those two great Institutions. Indifference will not do here; our Journalists and Committees have no right to take up their pages with minute anatomy and tediously detailed cases, while it is a question whether or not the "black-death" of child-bed is to be scattered broadcast by the agency of the mother's friend and adviser. Let the men who mould opinions look to it; if there is any voluntary blindness, any interested oversight, any culpable negligence, even, in such a matter, and the facts shall reach the public ear; the pestilence-carrier of the lying-in chamber must look to God for pardon, for man will never forgive him."

Holmes was not certain of the manner in which this pestilence was carried. His views may be summarized as follows:

"I shall not enter into any dispute about the particular mode of infection, whether it be by the atmosphere the physician carries about him into the sick-chamber, or by the direct application of the virus to the absorbing surfaces with which his hand comes in contact. Many facts and opinions are in favor of each of these modes of transmission. But it is obvious that in the majority of cases it must be impossible to decide by which of these channels the disease is conveyed, from the nature of the intercourse between the physician and the patient."

In 1847, Semmelweiss, a 28 year old assistant in the obstetrical clinic at Vienna, saw in a post-mortem wound of the finger sustained by his friend Kolletcha at the necropsy of a parturient woman, which caused his friend's death with findings similar to those observed in women dying of child-bed fever, a source for the contagion. He asked the students who participated in post-mortem examinations, to wash their hands in

chloride of lime before aiding with the duties of the lying-in chamber. Semmelweiss quickly demonstrated to his own satisfaction and that of some of his colleagues that the contagion was carried directly upon the hands of the attendants. Youth must bear its yoke. His superiors refused to take any notice of his claims. Impetuous and intolerant of criticism, Semmelweiss directed his energies into channels which led to his dismissal with lost opportunity. His earnestness is certainly to be admired. Said Semmelweiss:

"Should the professors not soon consent to have their medical students and interns instructed in my methods; should the administration continue to tolerate the epidemics of puerperal fever in the hospitals, I will direct myself to the public in order to secure proper protection for those to be confined. I will say: Father of the family! Do you know what it means to call a medical attendant for your wife at child-birth? It means that you put a hazard to life in the way of your wife and unborn child. If you do not wish to become a widower, and if you do not wish your unborn child injected with a lethal poison, and should your children not wish to lose their mother, go buy yourself a little calcium chloride; pour a little water on to dissolve it, and do not permit the physician or the midwife to make an internal examination of your wife until they have carefully washed their hands in the chlorine water. But do not blame the physician or the midwife for this threat to your wife's life. The responsibility lies with the professor of obstetrics who taught them and who failed to indicate that the resorption fever may be avoided by preventing infection from without. . . . I hope that the public will prove more capable of being instructed than the professors of obstetrics!"

Prophets have been stoned in places other than Jerusalem. Semmelweiss has already lived longer in his name than in his body, a distinction which most of us shall not achieve. When futurity has antiquated the present, time will still smile kindly on the courage and glory of this man whom her contemporaries ignored. Their curses have long since ceased their din upon his ears. We need the example of men like Semmelweiss more than they need our praise.

Antisepsis

Working quietly but feverishly in his laboratory in France was a chemist, Louis Pasteur, the medical Moses who was to revolutionize medicine and surgery and lead it out of the bondage and fear of suppuration. Life had confronted him with a number of practical tasks. With a genius for taking infinite pains, he had been able to solve the mystery of tartaric acid by demonstrating the presence of two tartars with the same chemical formula—one with laevorotatory, the other with dextrorotatory behavior toward a plane

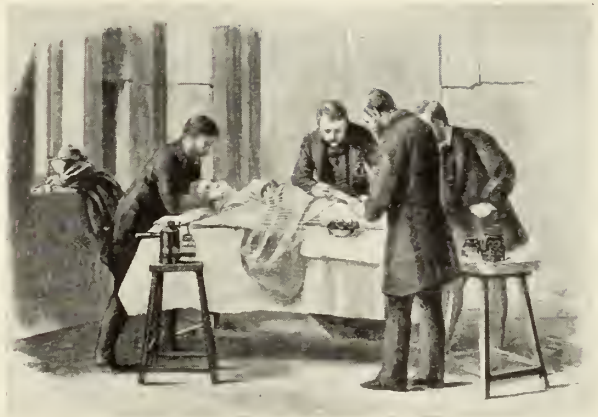


Figure 3. Lord Lister's (1827-1912) famous carbolic acid atmospheric spray in action at an operation.

of polarized light. In turn, he discovered that micro-organisms were the cause of the spoiling of beers and wine, and that a parasite was responsible for the catastrophes in the silk industries of southern France. These studies led him into an investigation of the nature of chicken-cholera, anthrax, and the general problem of infection. He crushed for good and all the doctrine of spontaneous generation and his successful vaccination of hydrophobia crowned his achievements. This man of humble origin did his best work after he had been stricken down with apoplexy at 46. Fortune dealt kindly with our medical Moses; for he lived to get more than a glimpse of the promised land from Mount Pisgah. He crossed the Jordan and when he died in 1895, the world acclaimed him as the greatest public benefactor of all time. He had kept the covenant.

The torch lit by Pasteur was to burn brightly in the hands of Lister, our surgical Joshua. He it was who by the application of antiseptics to the skin demonstrated that incisions could be made and that wounds would heal without the anticipated consequence of suppuration. For centuries, inflammation had continuously harassed the surgeons and frustrated their efforts. It is not amazing, therefore, that this new prophet, though his divinations were true, like Cassandra, was not believed. The walls of age-long prejudice were not to topple and fall like those of Jericho. The exultant shout of victory over all opposition was delayed well up toward the close of the last century.

The New Science of Bacteriology

In brief, this is the story of the origin of present-day surgery. The microscope and the employment of aniline dyes taught us, in the new medical science of bacteriology why wounds suppured. Man then quickly developed technical procedures which have gradually made it

possible to invade and attack disease-processes in every body cavity and almost every tissue. The growth of medical knowledge during the time which parallels the discovery and development of bacteriology has been unprecedented in the annals of medical history. An ever increasing flood of illumination has penetrated into the mysterious darkness of disease. A small faint source of flickering light, in which one groped blindly about, unable to read or see the cause of disease had suddenly become incandescent and brilliantly bright. The lamp lit by Koch, the father of bacteriology, has continued to burn, but the light has not always been so luminous, and has been inadequate to permit of satisfactory vision in the dim recesses of many diseases.

Within a few years, a score of bacterial diseases which had defied probing and understanding by the tedious, inexact, and inaccurate methods of noting the symptoms present and the tissue-effects produced, became clarified. The employment of a new approach to old problems had succeeded overnight in differentiating with precise methods what centuries of speculation and plodding effort had failed to do.

The studies in pathological anatomy by John Hunter, Bichat, Laënnec, Louis, Baillie, and later of Rokitansky and Virchow, together with the contributions of physiologists of the mark of Johannes Müller, Magendie, Claude Bernard, and Helmholtz had greatly enriched the stores of medical knowledge, but these innovations had influenced the practice of medicine but slightly. To these anatomic and physiologic contributions, the new bacteriological discoveries lent better understanding and increased importance; the results of previous morphological and physiological studies took on new meaning and their relation to the practice of medicine and as avenues for enlarging and extending the horizon of medical thought, became quickly apparent. The significance of the momentum afforded to already existing medical knowledge and the impetus lent to further exploration into the obscurities of medicine by the new science of bacteriology cannot be over estimated. Never before in the history of man had disease been seen and read with the crystalline clairvoyance made possible by this new tool. Medical journals multiplied to record the successive discoveries and conquests. New approaches to obscure problems created new and unfamiliar specialties of practice and brought into being new sciences to assail disease in the interphases between chemistry, physics, and mathematics. Never before had the yield been so plenteous and laborers for the vineyard came forward in numbers with their various talents for the harvest.

The New Surgery

The rôle of surgery in the elaboration of

knowledge concerning disease has been an important one. The therapeutic triumphs over dread afflictions once believed to be beyond remedy have been manifold. To enumerate many of them here would be impossible and wearisome. It may not be out of place, however, to retell the story of some of these victories and to recount briefly the manner in which surgery works and attains its ends today.

It is very fitting that one of the first applications to which the instrument of the new surgery was put was the relief of suffering women. So much of the exhausting drudgery of the daily tasks of life and the painful misery of woman's lot is borne in silent complacency that one feels a sense of gratification in this chivalry, however accidental it might have been.

The first aggressions into the abdomen under the auspices of antiseptic surgery were directed toward the removal of ovarian cysts which frequently distressed and incapacitated women as much on account of the size of the tumor as because of pain. Even before the days of anesthesia and antisepsis, however, Ephraim McDowell, a bold pioneer of the West, in 1809, in Danville, Kentucky, had succeeded in removing a large ovarian cyst from the abdomen of Mrs. Crawford. Eight times in 13 trials, success attended the fearless efforts of this intrepid surgical explorer.

In 1879, loyal admirers keenly impressed with the significance of McDowell's contribution erected a monument in his honor with the inscription: "Honor to whom honor is due." It is eminently just that within the past year a monument has also been erected in memory of the courage and resolute fortitude of the patient, Jane Todd Crawford.

The great pioneer work of Marion Sims in the aid of women, suffering from the presence of abnormal fistulous communications with bowel or bladder, which unfortunate accident occasionally attends precipitous child-birth was notably accelerated and advanced in the hands of the new surgery. The surgeon became bolder and invaded the hitherto unexplored domain of the vermiform appendix, the large and small intestine—even excising diseased portions of the stomach. Simultaneously, surgical attacks were directed with startling success upon concretions that formed in the gall bladder, kidney and urinary bladder, which had long been familiar and frequent causes of much human misery not susceptible of relief by ordinary medical measures. Even use of the hypodermic syringe employed in the administration of medicines to assuage the severity of such painful seizures was not with-

out its attended dangers until asepsis became the vogue.

Technical developments grew apace and more drastic operative procedures requiring greater care and deliberation could be done without serious risk. In 1866 Samuel Gross had said that the danger of hemorrhage was so great in operating upon goiter that only a fool would be induced to try it. By 1880 partial excision of the enlarged thyroid for the relief of mechanical obstruction to breathing was a common occurrence in surgical clinics. With the development of cerebral localization—a product of experimental surgical research and refinements in neurological diagnosis which indicated that definite areas in the brain directly correlate with certain peripheral nerves—with this knowledge came successful surgical intervention for the relief of increased intracranial pressure caused by brain tumors. Tumors of the spinal cord and its coverings proved even more amenable to surgery. By 1906, knowledge concerning the incompatibilities of blood groups and the technical features of transferring blood from one individual to another had been sufficiently worked out that blood transfusion—a therapeutic agency which had been taken up and discarded many times in the preceding 250 years because of the fatalities attending its use—became a reality. Transfusion of blood had superseded promiscuous blood letting as a remedial measure. Developments in surgery have created a demand for elaboration of other anesthetic agents and today we have local, regional, and intravenous anesthetic agents as well as a host of vapors which may be inhaled to allay the pain of operation. Emulating the principle of looking into the eye by means of reflected light, introduced by Helmholtz, endoscopic technique and instruments were quickly developed to look into practically every natural orifice of the body. With the aid of the X-rays, surgeons have recently developed methods of visualizing the urinary and biliary tracts by the introduction of a solution into a superficial vein. Surgeons have injected air into the spinal canal and ventricular system of the brain to afford the contrast in density which permits of better localization of tumors by the use of X-rays. Surgery of the extremities no longer concerned itself alone with the removal of dead or dying tissue. Broken bones in which one of the fragments projected through the skin when treated in accordance with the precepts of Lister, now ceased to carry such a formidable threat to life. Operations upon the delicate and intricate structure of the eye, a branch of surgery in which Albert V. Graefe, even before the days of antisepsis, had performed works of wonder, repairing failing vision—such operations now became even more successful in the hands of many ophthalmic sur-

geons who were followers of Listerism. The power to work miracles had descended upon many disciples and in many lands, persons with dimmed vision were to be privileged again to know what a pleasant thing it is "for the eyes to behold the sun."

With the development of means of administering anesthesia by overhead pressure to combat the subatmospheric pressure normally present in the pleural cavity, the thorax, the last strong-hold of the large body cavities to resist invasion of the surgeon, surrendered. And experiences gained in the war have made the correction of deformities the special concern of the plastic surgeon.

In these pages, I have occasionally described under the more inclusive caption of medicine the activities of the surgeon. The great growth of information in the biologic field has made it impossible for any one man to master equally all of the ramifications of medical knowledge and practice—let alone make any contributions to the patrimony of biologic science. The number of specialists in the medical field has now become so large as to impose a great task on any one who should attempt to enumerate them all. The problem of relating and taking advantage of gains in skill and knowledge possessed by any of these groups by the others is obviously an intricate and difficult problem. Today, divisions in practical medicine are based essentially on mastery of diagnostic and therapeutic agencies. The activities of the surgeon are no longer dictated by physicians who would limit their function to the care of wounds, ulcers, fractures, dislocations and operations of necessity. The surgeon has become a physician in the field of his interest. Today physicians and surgeons stand side by side not as master and servant but more as willing helpmates linked together by the bonds of a sacred duty combining different talents and responsibilities but similar interests in the care of the sick.

Surgery Then and Now

The contrast afforded in the preparation for and conduct of an operation in the pre-antiseptic era and that of present day practice is startling. Then, surgeons washed their hands after operation instead of before. The surgeon took his instruments out of his case much as a plumber removes his tools from his kit. Without more ado, he put them out on the table, took off his street-coat, and when in the hospital, donned a frock-coat which usually hung on its owner's hook in the operating room. The sleeves and other parts of this garb often bore too obvious traces of previous encounters with free hemorrhage. It was customary to put out only a pair of hemostats with which to close the mouths of bleeding vessels before they were secured with

ligatures. Marine sponges taken from the same kit were put out on the table and were employed to sponge up the blood accumulating in the wound. The surgeon frequently carried his sutures and needles in the lapel of his operating frock. It was not uncommon practice for the surgeon to taper the thread in the manner employed by a seamstress who points the tip of the thread with her lips before attempting to pass it through the eye of the needle. Though Lister had addressed the International Medical Congress which met in Philadelphia in 1876 upon the subject of antiseptic surgery, his words fell upon deaf ears. Some of the most celebrated surgeons in the country, as a last gesture before the skin incision was made, continued to strop the blades of their knives on their boots or the heels of their shoes. Many a spectacular surgeon between cuts, reposed the blade of his knife, pirate-fashion, between his teeth. Instruments accidentally dropped on the floor were replaced on the table by any bystander, for immediate use. An interested spectator was occasionally asked to put his hand into the wound and examine the tissue under consideration. However dreadful and incredible these practices may seem to you now, it is even more strange to recollect that such methods prevailed amongst the most respected of the surgical profession in this and other countries until in the early eighties when the momentum of the precepts of Listerism crushed all opposition. Following the assault upon President Garfield in 1881, he was attended by two of America's best known surgeons of the time, who together with the other medical attendants probed the bullet wound with their fingers and catheters. An antiseptic dressing was applied to the wound, but there is no suggestion that other precautions were observed to avoid infection of the wound. There remains but little doubt that these maneuvers and the failure to heed the warning uttered by Lister in this country five years before were of major consequence in bringing about Garfield's death somewhat more than two months following the receipt of the injury. Here and there, however, as late as 1900 the doctor refused soap and water for the cleansing of his hands offered him by the widow, before going into the lying-in chamber, saying, "No, thank you, I washed my hands just before I tied up my horse."

The late W. W. Keen states that at the second battle of Bull Run he had charge of a caravan of 36 wagons of medical supplies. Eleven of this number carried only alcohol, brandy, and wine for the injured—indeed a very liberal portion of the medical supplies. We have no testimony that the generous internal administration of this remedy accomplished very much. Had that medication been employed externally as the good

Samaritan used it in binding up the wounds of the man who fell amongst thieves "pouring in oil and wine" how many lives would have been saved. How this parable might have been cited for the instruction of surgeons as well as lawyers!

Lister believed that the danger lurked in the air and devised a carbolic acid dressing to exclude the putrefactive influence of the atmosphere and sprayed the operating room and the field of operation generously with a solution of dilute carbolic acid during the operation. It was soon learned that the air itself was the least important source of the contagion—that the patient's skin, the hands of the surgeon and his assistants, the instruments, linen and gauze must all be rendered as sterile as possible. Thermal sterilization quickly replaced the chemical. Participants in the operation donned sterile gowns and added the wearing of sterilized rubber gloves to meticulous mechanical cleansing of the hands for the added safety of the patient and finally it was appreciated that wearing of masks covering mouth and nose was highly essential in order to preclude droplet infection of the wound. Surgery, however, was not born full-fledged like Minerva, the goddess of the handicrafts. From year to year new methods and techniques have caused surgery to exhibit improvement similar to that manifested in our motor cars over 5 or 10 year periods.

A third year medical student or a student nurse who has had the opportunity of witnessing operations but whose hand has never poised a scalpel would be a far safer surgeon than the best of that period, despite serious lack of experience and skill. The hospital with its present day appointments is equally as changed as is the surgeon. A person in no small measure responsible for the improvement in its atmosphere is the nurse. The rôle of the nurse in the care of the sick and particularly of surgical patients is a most important one. When one contemplates the Betsy Prig or Sairey Gamp of Dickens' time, he cannot fail to recognize the extent of the reformation which has simultaneously occurred in nursing. The movement which Florence Nightingale set in motion in Scutari during the Crimean war, for the aid of ill and injured soldiers will keep her memory bright forever. Only since Lister and Florence Nightingale have hospitals become true havens for the sick. Before Lister, the patient accepted chances with no more promise than those afforded gamblers at Monte Carlo. Today, the risk of almost every operative procedure can be reasonably gauged and the patient can decide whether the gain is worth the hazard.

The new surgery created and brought the modern hospital into being. Despite all our striving for uniformity and attempts at stand-

ardization, every hospital, as Harvey Cushing has so well said, has a personality all its own—an intangible quality, let us hope that is always an asset. This character represents usually a combination of individualities rather than individual accomplishments. To this fusion, all who have worked in the hospital, no matter how lowly his position, brings his contribution. The student nurses, their superiors, the orderlies, the clerical force, social service workers, students, house-officers, and staff—these help to mould the personality of a hospital—in which expressions, Axel, the orderly, who takes pride in the giving of a fine enema or Charlie, elevator operator who dressed the Christmas trees since the hospital was built and still comes back to discharge this function after retirement and helpful Fred Hamilton, hospital engineer; the foot-weary instrument nurse who continues to pass hemostats to the less agreeable and somewhat imperious surgeon; the over-worked, underpaid and faithful secretary who labors in and out of season without complaint to write the letters and type the papers of her chief; loyal assistants who lend patient and attentive ears to the inquiries of the sick and their relatives after a hard day's work in the operating room and who still have energy and enthusiasm to pursue an investigation in the experimental laboratory in their few hours of leisure—these noble men and women who live and love their work and bring to their jobs their very best effort—they help to mould the spirit of a hospital as much as the senior staff or the hospital director who tells us how much money we may spend. The ward-maid, anxious over the personal comforts of the patients of her charge, worries about the old man with the hip whom Dr. Cole operated upon yesterday, and the baby with the cleft-palate repaired by Dr. Ritchie. She wonders whether the window left open may have been the reason that John in 407 failed to recover from his operation. To the hospital superintendent falls the more important but less interesting task of worrying about the per-diem cost. One may well, with the poet, inquire, "In the sweet ear of nature, whose song is the best?"

Trends in Surgery

Over and over again, time has demonstrated that the borders of medicine and surgery are not fixed but subject to constant change. We are continually striving to find means of treating surgically diseases which are refractory to medical management. At the same time, an uninterrupted and restless search is always on for more conservative agents which may adequately replace satisfactory but more energetic operative intervention. These imaginative pursuits and dreams of physicians and surgeons are often matters of stern reality to the patient afflicted with an internal disorder for which medicine can

do nothing, as well as to the patient faced with the prospect of operation for the relief of his complaint. The one asks, "May not an operation help me?" The other, "Can not the same result be accomplished without operation?" These two opposed activities of the surgeon—greater conservatism in the management of diseases already amenable to operative intervention; and aggression bordering on radicalism in diseases refractory to any known extent—these activities are always in progress like the changes in a reversible chemical reaction.

We find the surgeon on the one hand excising a portion or all of the stomach or colon or removing an entire lung for cancer, extirpating the urinary bladder similarly affected and transplanting the ureters into the bowel, as well as entering the skull and removing generous portions of the brain when the seat of a malignant tumor; we find him removing almost all the ribs on one side of the chest in order to obtain mechanical compression for the diseased lung and stop the ravages of tuberculosis when bed rest and medical measures have failed.

We find him so bold as to excise liberal portions of the sympathetic nervous system to secure relief of pain and an improved peripheral circulation in patients with spastic contraction of their blood vessels where gangrene is threatening. This same rash endeavor he applies occasionally to physiologic spastic types of bowel obstruction and even constipation. And now we find him attempting to relieve the menacing threats of high blood pressure with its consequences by removing portions of the sympathetic nerves and the adrenal gland. No portion of the human anatomy seems to have withstood the force of his invasion. He is found removing small tumors in the pancreas that produce insulin in excess and cause its owner to have lethargy and convulsions—tumors whose presence had long been noted but which were generally believed to be without significance. We find him trying to revive patients, who stand on the brink of death from the rare but appalling disaster of pulmonary embolism, in which a blood clot loosens during convalescence after operation and propagates itself as a thrombus obstructing the pulmonary artery, making respiration ineffectual.

Mandl, an enterprising young surgeon in Vienna, solved the mystery of multiple bone cysts with associated parathyroid tumors which condition had long intrigued pathologists by excising a parathyroid tumor and arresting the disease-process. We find the surgeon now the strong right arm of the endocrinologist in attacks upon tumors of glands such as the adrenal, hypophysis, ovary and testis which affect body growth and development as well as personality. This romantic activity of the surgeon promises to be one

of the most dramatic and fruitful of all his labors. My colleague, Dr. McQuarrie, will later elaborate the rôle of the surgeon in this most fascinating province of medicine.

At the same time, this intrepid and somewhat reckless fellow, the surgeon, will be found injecting sclerosing solutions into varicose veins to obliterate them instead of excising them as he was wont to do a few decades earlier. We find him attempting to cure hernias as well as hemorrhoids by injection rather than by operation. Truly, the hypodermic needle threatens to be mightier than the scalpel in the treatment of many surgical disorders. We find him aspirating gas and fluid from the distended stomach and upper reaches of the intestinal canal by an inlying duodenal tube to afford relief of obstruction without operation; or clipping off portions of the prostate gland which projects into the bladder causing urinary retention in aging men.

Strange as it may seem to you, the surgeon often appears to find in the successes of these strategic lesser surgical triumphs greater cause for rejoicing than in the more brilliant and colorful victories of bold aggressions for he knows that they are purchased with less risk of life and cost patients less apprehension.

Unsolved Problems

In addition to the anxieties, trials and tribulations of his work which tend to make of the surgeon a modest man, any inclination to vanity or pride is short-lived, in that the surgeon is daily reminded of the many diseases for which his art can do nothing and in which he is but a passive spectator. The scourges of cancer and infection take yearly a large toll of lives despite the best effort on the part of physicians and surgeons. To be certain, the surgeon has his successes, but when he reckons his losses, he is dismayed to see how large the winnings of Death have been. With the many attacks launched upon the problem of cancer from every approach, one may hope soon to hear that this strong-hold of disease has yielded. Whereas the precepts of Pasteur and Lister have made it feasible to explore practically every body cavity with impunity, when the surgeon is confronted with established infection, the problem is essentially the same as it was before the days of Lister. Virulent spreading infections are as dangerous today as then. The surgeon in dealing with infection can only incise a localized collection of pus as in an abscess or prophylactically prevent extension of infection into a larger space as is best exemplified in the early removal of an inflamed appendix. When infection is spreading whether it be in the arm, the brain, or the lung, the surgeon can only do harm by intervention and must resign himself to supporting the natural defenses of the body, of which my colleague, Dr. Bell, will

later speak at length. The patient must grimly fight out the battle with the infection with little or no specific help from his surgeon. Ambrose Paré recognized the limitations of surgery; he said, "I treated him, but God healed him."

As one reads the expressed hopes kindled in the breast of medical men by the rapid bacteriological discoveries of the eighties and nineties and the first few years of this century, he might be led to believe that a specific treatment would soon be available for every bacterial disease. Suddenly, however, the triumphant exploits of the bacteriologist seemed to have reached an impasse and no new great victories have been won. Yet, it is to the development of bacteriology and pharmacologic aids that we must look for more light in our fight upon infections. Much of what has been accomplished, in the eyes of the pre-Listerian era is as much a miracle as the granting of vision to the blind Bartimaeus. Asepsis is the birthright of the present generation of physicians and surgeons. We take a just pride in it, but until we have enlarged this heritage, how can we feel proud? We must look to our laurels for posterity will find no lasting satisfaction in our achievement and that she will greatly improve upon our possessions one may write down not as a prediction but as a foregone conclusion. Our accomplishment by contrast with that of our antecedents may entitle us to feel like Brobdingnagians—but that exhilaration can be only short-lived, for, by comparison, the achievements of our successors will prove us to be mere Lilliputians.

Buried in the literary catacombs of the volumes which occupy the shelves of our libraries undoubtedly lie suggestions which if properly synthesized and co-ordinated would shed luminous light on our unsolved problems of infection and cancer. Were these volumes to be more worn by us than by time, the likelihood of important discoveries through the conversion of known facts into ideas would be greatly enhanced. We must often wait patiently and long for the discerning dreams of a Joseph or a Daniel who will be able to make such syntheses or lead us by a path yet unknown, directly to the solution of such problems as those presented by cancer and infection.

The Role of Experimental Surgery

How anesthesia and asepsis reformed surgery is a revelation; how in turn the new surgery improved medicine, afforded abundant opportunity for observation of disease-processes and supplied new methods of bringing relief to man suffering from serious bodily disorders are but natural consequences of that great stimulus. The most significant advances in medicine are now coming about through the employment of surgery in the experimental study and investigation of disease. The anatomical structure of organ

could be studied upon the dead body, but how these organs function is only to be ascertained during life. The new surgery served this objective admirably, and played an important rôle in the development of our knowledge of digestion, the circulation, respiration and the function of the ductless glands. How Harvey by animal experimentation proved that the blood circulates, even before the rise and development of the new physics and chemistry, attests the great significance of the experimental method in the study of normal function. For centuries speculation had been rife as to what the relationship was between the heart, the lungs, and blood vessels. These disputations had only succeeded in complicating and confusing the issue. A few simple experiments in the hands of an accurate observer brought enlightenment that left no room for further argumentation.

How much sooner Lister would have succeeded in dispelling the cloak of ignorance had he employed the advantages of animal experimentation. John Hunter recognized the superiority of the experimental method over logic. To Edward Jenner, of smallpox vaccination fame, Hunter said, "Try the experiment, don't think." Rationalization too often proves deceptive, not because the logic is fallacious, but rather because the knowledge of the factual data bearing on the matter is incomplete or the initial premises themselves may be wrong. History has repeatedly taught how apparently sound reasoning and deduction have led us astray. If all the factual data bearing on an issue were known and available to the one attempting its rationalization, a logician who would take the time to become thoroughly acquainted with the subject under discussion could deliver a satisfactory and accurate answer to any question propounded him. Direct experimentation will always have an important place in all human activity. How speculation and vacuous arguments have retarded human progress! The crucial test of experiment deletes our textbooks of medical and surgical barnacles and ancient errors that have been re-copied for generations.

The few years which have run through the hour glass of time within the experience of the youngest of this audience have witnessed two innovations of experimental surgery that have brought life and happiness to thousands of homes throughout the world. In 1921, Frederick Banting, an orthopedic surgeon in London, Ontario, abandoned his practice, convinced that the internal secretion of the pancreas could be isolated by eliminating the confusing influence of the digestive secretions of the same gland. In his imagination, known facts were built into an idea. Within a few months together with helpful colleagues, he had succeeded. His name has since become

a household word to be cherished in gratitude in homes where insulin helps diabetics to live and lead more normal lives. To the hands and creative mind of the pathologist, George Whipple, experimental surgery furnished the means of attacking the problem of blood regeneration in anemia. What Whipple learned of the value of liver as a dietary measure in the repair of blood loss was put to practical use by Minot and Murphy. Today in consequence, persons afflicted with the hitherto invariably fatal pernicious anemia can, with the aid of liver, live normal lives. Only homes which lost a mother or father or other dear one a short time before this discovery was made can fully appreciate the blessings of this new knowledge denied them, but enjoyed by others.

Yet, we hear prejudiced people raising their voices against animal experimentation. In this and other municipalities, there is a self-styled "animal rescue league" which takes homeless dogs off the street and asphyxiates those which are not claimed. What deception there is in this disguise—the voice of Jacob, to be sure, but the hand of Esau! To kill without purpose—no savage barbarism could be more cruel than this! When man no longer slays animals for food or clothing or holds them subservient to his will, the significance of truths learned in animal experiments will fully justify their performance for the protection and prolongation of human life. One of the most valued instruments in the relentless search for the cause and alleviation of disease is the experimental method. Matters of such vital importance to health and happiness cannot be left to chance. Biological research employing the scientific method must go on; its discoveries and benefits are available to all men irrespective of creed or birth or whether rich or poor; through its agency more lives are saved than all the wars of all the ages have thrown away. Like a divining rod, the experimental method wrests truths from nature, which would otherwise percolate for centuries through the slow filters of time.

The Future of Surgery

What of the future of surgery? Any child who can speak can ask questions which none of us can answer. Just now, endocrinology in its broad aspect, in which activity surgery plays an important rôle, seems to hold forth a promise almost equal to that of bacteriology of 60 years ago. Whether advances in surgery will be made at a snail-like pace or in rapid strides will be determined not alone by discoveries in medicine as a whole but by developments in general biology and the physical sciences. The two greatest benefactions of surgery to man are in reality gifts of chemistry to surgery. To be sure, ether and nitrous oxide inhalations were

mere chemical playthings of the lecture hall until surgeons demonstrated their great value in the relief of pain. The value of chemical antiseptics and asepsis in the prevention of infection were wholly unknown till empirical trial and the discovery of micro-organisms declared their true worth. Anesthesia made operations possible; antiseptics and asepsis have made them safe. Discovery of the X-rays by Roentgen and of radio activity by Becquerel and of radium by the Curies have been a great boon to medicine—gifts from physics. The new science of bacteriology was essentially an outgrowth of chemistry, microscopy (physics) and medicine. No man can, like Francis Bacon, take all knowledge for his province. It is, however, still true that some of our most valuable and useful information in the warfare on disease is to be learned at outposts stationed in the interphases of activity between greater medicine and our biological and physical sister sciences. Only through the activity of alert eyes and minds scanning the horizon in these interphases, will the great lag between discovery and application become a less common occurrence.

Surgery, long a parasite on the common stores of knowledge, now has its own contribution to make. Recognition of the importance of the experimental laboratory for all workers in the field of clinical medicine is rapidly gaining ground. We have been accustomed to hear that the hospital wards are the laboratories of physicians and surgeons. No—accurate observations may be made there and occasionally significant rationalizations may be made from such observations; only in the experimental laboratory, however, may the factors which bear on the observation be varied and a true analysis of its significance be reached. The crucial test of direct experimentation will serve to avoid the pitfalls of rationalization on incomplete factual data. The pedantry of authority has given way before the testimony of fact.

The interests of greater medicine, I cannot believe, will be best served by the complete withdrawal of groups such as anatomists and physiologists into the tranquil detachment of scholastic seclusion afforded by their laboratories. The great stimulus of enthusiasm gained by daily first-hand contact with unsolved problems can scarcely reach them there. Amidst the arduous responsibilities of service and practice, Vesalius, Paré, Harvey, Hunter, Jenner, Laennec, Koch, and Lister—among the most illustrious men in medicine of all times—still found time to prosecute fruitful researches. At the same time, the clinical investigator intent upon the diverting and time consuming occupation of his daily tasks may awaken to find himself the victim of a circumstance which befell Commander Peary, who while together with his companions on one

of his Arctic explorations, found after some days that while they walked eight miles a day on a sheet of ice, they were being carried back ten miles by the current of the water. The vitalizing influence of stimulating teachers and investigators is becoming more generally recognized as transcending in importance all other material wealth of medical schools and institutions. The most valuable possession of a university, said the late William Osler in an address to medical students on this campus 44 years ago, are the names of the inspiring teachers of its faculty.

The surgeon, one occasionally hears it said, is a calloused individual who places little value on human life. If those who think so could only know the anguish, despair, and self-reproach of the surgeon with a knowing conscience, who feels that something which he did or failed to do, had a part in bringing an illness to an unhappy ending, how much more often the surgeon would be pitied than censured.

The reassuring expressions of grateful patients more than reward surgeons for the hours of haunting anxieties which it is their lot to bear. The irrepressible joy and delight of children once sick and now restored to normal living, the restoration of health to the weary and suffering through the benisons of surgery—these are the best paymasters of the surgeon and satisfactions which he cherishes in his memory as among the most worth-while of life's treasures. With his pre-occupation of mind the surgeon may not learn much of life. But he is privileged to hear from the lips of people from every walk of life and read often in their anxious and despairing faces what to them is most worth-while. How much it is to be regretted that it is not in the possession but in its pursuit that the greatest value is put on health.

If advances in our knowledge concerning disease should make much of present day surgery unnecessary, the surgeon would be the first to welcome such an occurrence. For despite the painlessness of operations, he sees in the distressed faces of persons about to come under the knife, unexpressed fears relating to the anesthetic and the operation. How can he but wish that patients could be spared these anxieties? However much the surgeon may desire that relief could be afforded without recourse to operation, and however surgery may change with the developments in greater medicine, it is quite safe to predict that there will be always a need for the services of surgeons. The verniform appendix with its bad anatomical arrangement, which man gives no sign of outgrowing, will, when obstructed, probably always need excision; congenital and acquired deformities will necessitate operation for their correction, and automobile accidents appear to supply a constant field of



Figure 4. "Many more people, therefore, gain the crest of the bridge of life"

activity for the surgeon. Yes, there are diseases yet unnamed for which surgery will be necessary!

The surgery of the future will integrate itself more closely with the problems of the social order. Forward looking man no longer labels the dissection of dead bodies as a sacrilege. He has learned that information secured therefrom redounds at once to his own gain. Anesthesia is no longer looked upon as an impious attempt to thwart divine will, and the great significance of animal experimentation for the welfare of man is being more generally recognized and appreciated. Sterilization of the socially unfit, which would burden society with progeny of an undesirable kind, is certainly not far off.

Search for a fountain which would restore youth to aging men has not been an occupation peculiar to Ponce de Leons and the dreams of poets. Surgical explorers who have gone in this quest have met the same fate which befell Ponce de Leon. The death of persons in the prime of life from a defect in a single tissue, whose bodies are otherwise sound, is as wanton desolation of human life as the discard of a good automobile with a plug in its gasoline line. The function of medicine and surgery appears to be rather with the prevention of and salvage from occurrences of this sort. Whereas more people live to be old, there appears to be no good proof that people live to be older. The conjoint forces of public health and pediatrics have largely done away with the scourges which decimated the lives of infants and children. Many more people, therefore, gain the crest of the bridge of life (*see Figure 4*), but the mortality beyond, because of the enormous toll taken by the degenerative diseases of increasing age, still continues.

Though we hear much said about the stress and tension of modern life and its causative relationship to premature death in the useful period of middle life, there is but slender evidence to indi-

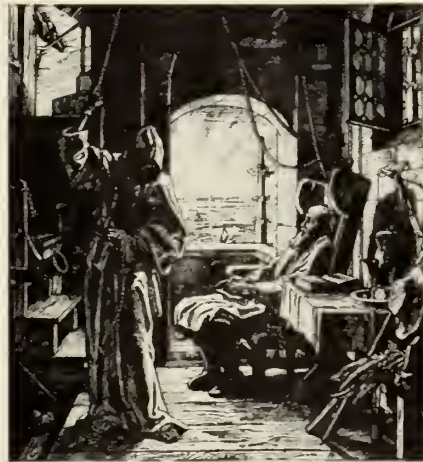


Figure 5. ". . . greater numbers shall come to their graves 'in a full age, like a shock of corn cometh in, in his season'."

cate, in the main, that man will live longer if he rusts out than if he wears out. And the joys and satisfactions gained in the knowledge of work well done are numbered amongst the pleasures that will not be foregone. It is apparently no longer true that the equanimity of a Methuselah, whose only chronicle was long life, will assure longevity. After Mathuselah had lived more than 400 years, an angel is said to have appeared before him with the suggestion that he build himself a house for he was yet to live more than 500 years. The chronicler relates that Methuselah felt the promise not worth the effort. Raymond Pearl has observed, however, that nonagenarians and centenarians as a group are uniformly characterized by a calm and equable temperament. Old age creeps daily upon us and will not be deferred. We see his mark upon another's brow more readily than upon our own. There seems but little likelihood that man will ever succeed in prolonging life greatly beyond its period of usefulness. It appears to be a law of life that when vital energies wane, death is near. Having eaten of the tree of knowledge, was not man driven out of the garden of Eden "lest he put forth his hand and take also of the tree of life, and eat, and live forever?"

The surgery of the future will continue to relate itself to man's needs so that men may lead more full, complete and useful lives, and greater numbers shall come to their graves "in a full age, like a shock of corn cometh in, in his season." Surgeons will strive to relieve suffering, to repair injuries and save life. And when life is only a burden and medicine can bring no relief, when the social order recognizes the right of the individual to release from such distress, he can be helped on to a peaceful sleep in which there is no remembrance of painful things.

Conclusions

No panoramic view of the benefactions of surgery to man are contained in these remarks. Rather an attempt has been made to indicate the manner in which surgery, once an heroic remedy for a desperate ailment and concerned largely with the management of wounds, has come to enjoy an important position in the treatment of disease. The history of surgery teaches the important lesson that a single fact evolved from accurate observation is of more utility than an entire system of speculative invention. Facts built into ideas by the creative power of imagination, that all important coefficient of the mind, estab-

lishes truths, overthrows false doctrines, and destroys the tyranny and frost of custom and dogma. You may have been unable from these comments to decide whether surgery is a trade, craft, art, or science. Leonardo da Vinci, one of the world's most resplendent figures of all time, recognized no great difference between handicraft, art, and science. The surgeon worthy of the name combines in liberal measure the love of humanity, science and craft. However one may choose to designate the activities of the surgeon, it has been my pleasure and privilege to relate something of the most beneficent achievements for mankind in the annals of man.

Medical Care of University Students

Warren E. Forsythe, M.D.*

Ann Arbor, Michigan

THE medical care of special groups of people is a chapter in the history of medicine. Under a wide range of variation in policy and program, college students in the United States have received medical care as a special group since 1859. In that year the first American college physician, Dr. Edward Hitchcock, was appointed at Amherst, following reports by President Stearns from which the following is quoted:

"The breaking down of the health of the students, especially in the spring of the year, which is exceedingly common, involving the necessity of leaving college in many instances, and crippling the energies and destroying the prospects of not a few who remain, is in my opinion wholly unnecessary if proper measures could be taken to prevent it."¹

The program inaugurated by Dr. Hitchcock might well be followed today. The American Student Health Association now lists over one hundred member departments in colleges interested in student health work. About five hundred formal papers have been published dealing with the medical aspects of the problem and a national conference held in 1931 issued a comprehensive report² on college hygiene. Many reports of surveys have been made.³

The college programs have varied greatly, but usually have included attention to teaching, sanitation, physical education, and student illness. The strictly medical care of the sick under college auspices has been most subject to professional criticism. In the writer's judgment, responsibility for strictly clinical service to sick students should be assumed by the college only because certain necessities in the situation are not being met otherwise. The college has responsibility to parents and to the state for custody of students; students learn best by actual experience the methods of good scientific medical care; since the prevention of much illness requires early attention to beginning processes, students should have

access to medical advice with the least possible hindrance, such as fear of costs; also the educational experience of worthy students should not be allowed to terminate because of the element of large expense for major illness. When these conditions can be satisfied otherwise, the college administrators will probably be glad to confine their hygiene programs to work characterized by the term health education. It is fair and proper to ask to what extent these clinical activities should now be allowed to retard the development of the primary health education features of a program in college hygiene.

At the University of Michigan the program has been outstanding because of provision for very generous clinical service, centralized and supported upon a basis of distributed cost to students. The University Health Service was inaugurated by Dr. Howard H. Cummings in 1913 and it rapidly expanded to provide for practically complete medical care of these students.

It provides unlimited out patient service with attention of all specialties, including psychiatry, allergy, usual X-rays, ordinary drugs, dressings, laboratory, *etc.* Room calls are made at small charges to the patient. Bed care is extended for thirty days in any school year with emergency operations and all medical service. Charges are made for special nurses and expensive drugs. Eye glasses are provided at special prices, as are elective services not available in the department.

Fifty persons are on the staff. Sixteen physicians are about equally divided between full time and part time status. The general physicians are on full time, do some teaching, and several are medical advisers to particular groups of students.

Because of many years of work with a fairly complete organization, the accumulated data and experience should be reliable in determining questions of illness and related problems for a population of young adults. As

* Director, Health Service, University of Michigan, Ann Arbor.

TABLE No. I.
Requested Services at Intervals for Regular Sessions.
Rates per 1,000 Students Enrolled

Items	School Year Rates—Summer Session Not Included					
	1913-14	1917-18	1921-22	1925-26	1929-30	1933-34
Office clinic visits	2,946	4,949	5,335	4,041	6,517	11,613
Patients	703	711	728	775	855	941
Room calls	73	110	153	206	146	145
Hospital and Infirmary patients—MEN .....	.....	.....	.....	130	128	210
Hospital and Infirmary patients—WOMEN .....	.....	.....	.....	148	179	238
Deaths—all causes, in Ann Arbor and elsewhere	1.1	1.5	.9	1.3	.8	.7
*Prescriptions filled .....	.....	349	715	260	828	1,542
Refractions .....	.....	.....	126	105	130	165
X-ray examinations .....	.....	.....	184	104	255	460
Physiotherapy treatments .....	.....	.....	.....	.....	871	949
Consultations—Mental Hygiene .....	.....	.....	.....	.....	142	1,569
Major operations—general anaesthesia .....	.....	4	6	5	8	8
Laboratory determinations .....	.....	155	418	540	1,049	1,621
Tonsil and sub-mucous operations—local anaesthesia .....	.....	.....	2	12	25	25
Total Enrollment (entitled to service) not rates	5,520	4,579	8,113	8,594	8,833	7,314

*Undetermined amount of drugs dispensed in offices also.

an over view of this experience, some data and discussions are given herewith.

Health Examination—New Students

The health program for students at the University of Michigan starts with an entrance examination. This determines possible contagions and serves as a basis for the physician's advice regarding desirable programs for individual students. Defects are recognized and constructive health measures suggested. Last fall the entrance examination included a routine chest X-ray film, and for several years has included a tuberculin test for women. The health evaluation of entering students is difficult, even with our complete tabulations. About 75% of them are rated as having good health appearance, health weight, satisfactory all live teeth, not obviously vulnerable personality, good vision, freedom from nervousness, and freedom from previous infection with tuberculosis. About two per thousand are refused admission because of active tuberculosis; practically none for other reasons.

Hernia, organic hearts, hemorrhoids, and glycosuria are found for about one per cent. Fifty per cent have had tonsillectomy; thirty per cent are classed as allergic; fifteen per cent are unvaccinated; and one in ten has a history of appendicitis. About one half of the girls have varying dysmenorrhea.

The follow-up of these entering students assures a fair degree of correction of, or attention to defects. The amount of correction depends upon student finances, persistence in securing contacts, personality of medical adviser, and the like. The health program for women students includes resident nurses in the dormitories.

Periodic Examinations

The modern public health program has accepted the annual health examination as a basic element in its program. The success of this project in the general popula-

tion has probably been all that could reasonably be expected. The annual examination and health conference have had considerable emphasis in some college programs, and were required of all students here during a five-year period. The required examination was discontinued here, however, because of insufficient staff and facilities to do it properly and meet a heavy demand for clinic service. Also, the careful entrance examination and the accessible clinic brought to light most of the readily detectable physical defects. More recently, the annual check-up has been promoted as a voluntary or incidental project, and it appears to be gaining as a requested service. In the writer's judgment, it is time for colleges seriously to require that each student clear annually with a department which can make a careful evaluation of physical and emotional status; upon this determination continued residence would depend. With this in mind, a study of four hundred students showed about 25% who might reasonably be held for corrective work.

Our students gain an average of five to ten pounds during their first year. On the basis of judgments of students and physicians about 5 per cent have worse health after college entrance, and 35 per cent have improved health. About 50 per cent receive X-ray examinations of their lungs during four years here, and 25 per cent of upper-class students are so examined annually. Albumin in the urine is found much more frequently at the entrance examination than later.

Since the work at Michigan has been outstanding in the provision of care for illness to students during residence, its data should be significant as to the medical needs of young adults. Trend data are given in Tables I and II, for five year intervals, which appear to be typical of data for intervening years.

The amount of illness in freshmen, as compared to other classes, and the sex differences are apparently not very significant. Table No. III gives the analysis of

TABLE No. II
 DIAGNOSES SELECTED AT INTERVALS—Regular Sessions.
 Annual Rates per 1,000 Students Enrolled.
 Diagnoses result from requested services.

Diagnoses	School Year Rates—Summer Session Not Included					
	1913-14	1917-18	1921-22	1925-26	1929-30	1933-34
Upper respiratory infections—Men	488	937	885	668	738	1,101
Upper respiratory infections—Women	289	694	631	514	659	853
Appendicitis, acute	7	7	8	7	8	10
Contagions	4	28	5	20	7	5
Scabies	2	3	10	9	5	3
Epidermophytosis			23	29	98	182
Tuberculosis of lungs active	2	1.5	2.2	1	2.5	2
Constipation	15	21	25	13	25	48
Gonorrhea	4	2	2	1	5	4
Syphilis	.7	1.5	.1	1.2	.7	2
Pneumonia	.7	1.5	2.2	3	4	8
Diabetes	.4		.2	.2	.4	1
Fractures	7	7	9	12	20	17
Reactions psychiatrically classifiable	27	9	8	5	22	74
Otitis media acute	8	5	3	8	8	10
Sinusitis acute	3	6	21	27	29	19
Vincent's angina		3	4	5	5	11
Glycosuria			1	2	4	9

TABLE No. III.
 ILLNESS RATIOS BY CLASSES AND SEX.
 Based upon records of eight recent years of about 8,000 men and
 3,000 women freshmen. Decreased numbers for upper classes.
 Ratios relate to freshmen men as one.

Illness Item	Groups							
	Freshmen		Sophomores		Juniors		Seniors	
	Men	Women	Men	Women	Men	Women	Men	Women
Total patients	1.0	.99	.99	.97	.99	.93	.98	.89
Dispensary calls	1.0	1.24	.86	1.04	.86	.94	.89	.95
Had room calls	1.0	1.42	1.02	1.36	1.06	1.38	1.06	1.32
Acute U. R. I. diagnoses	1.0	.80	1.08	.85	1.16	.85	1.12	.75
Infirmery and Hospital patients	1.0	.66	.78	.82	.78	.87	.76	.76
Infirmery and Hospital days	1.0	1.02	.99	1.14	1.07	1.63	1.11	1.32

data for many years on this question as ratios of the first year's experience.

Finances

The departmental annual budget has increased gradually from about \$10,000 to \$125,000. This does not pay for building overhead nor for refer service from the University Hospital. It does, however, provide for some teaching as an offset against these non-budgeted services to students. The budget is provided from student tuition. There are small earnings which deducted give the net expense rates shown in Table No. IV.

1. Includes dispensary nursing, general supplies, and equipment, excluding drugs.
2. Significant earnings here—Gross equal double amount.
3. Significant earnings here—Gross equal four times amount.

Based upon our estimates of cost, this very complete service to groups of 10,000 at student age could be supplied annually under average social conditions for \$21.00 per person. Service rendered through the department for one year was evaluated at the usual private practice rates and thus estimated, it would have cost two and a half times as much.

Salaries averaged about 75%, hospital expense 20%, and supplies and equipment 5-10%, for a typical year.

Hospitalizations

Even with one half the desired number of easily available infirmery beds, about 20% of our students are hospitalized each year. The average stay is 4 to 5 days since most conditions are early processes, put to bed for prevention and to give best attention. Table No. VI indicates types of illness most frequently responsible for hospitalization of our students.

TABLE IV.
ANNUAL EXPENSE RATES
Regular Session per 1,000 Students Enrolled—5 Year Intervals.

Net Cost	School Year Rates—Summer Session Not Included					
	1913-14	1917-18	1921-22	1925-26	1929-30	1933-34
All service	\$2,118	\$4,039	\$5,646	\$6,539	\$9,425	\$14,103
Clinic Ambulatory service			4,469	3,295	5,754	9,211
Hospital service		181	2,009	2,875	2,372	2,994
Salaries and wages	115	2,820	2,998	3,716	6,102	9,926
Equipment and all supplies	760	437	709	846	898	1,133
Drugs (only)					217	441
Earnings (not cost)	73	128	329	409	622	405
Expense per clinic service—not rates		\$.66	\$.71	\$.93	\$.98	\$.86

TABLE V.
BUDGET DISTRIBUTION
Net 1931-32

UNIT	COSTS		
	Percent of Total	Per Patient	Per Service
General physicians	21.0	\$2.80	\$.30
Infirmary service	15.0	12.65	2.65 (day)
Mental hygiene	13.0	23.05	1.70
Administration	11.0	1.45	.90
Hospital care non-infirmary	8.0	52.10	5.90 (day)
1. Dispensary	6.3	.85	.10
X-ray	6.2		1.95
Pharmacy	4.5	.60	.05
Entrance examinations	2.9	1.05	1.05
Surgeon	2.4		.90
Laboratory	2.0		.20
Sensitization	1.0	3.15	.80
Physiotherapy	1.8	1.65	.30
2. Ophthalmology	1.5	1.55	.50
Hospital out-patient service	0.8	.65	
Dermatology	0.8		.35
3. Otolaryngology	0.6		.25
Dental	0.4		.45

TABLE No. VI.
HOSPITALIZED CONDITIONS—SELECTED.
Regular Session 1934-35—Combined Sexes.

Condition	Number	Percent
Infections, acute respiratory	487	38
Infections, acute gastro-intestinal	100	8
Infections, acute, local	92	7
Reactions, psychiatrically classifiable	87	7
Appendicitis	62	5
Tonsillitis, acute	45	4
Pneumonia	30	2
Concussion	13	1
Mononucleosis, infectious	13	1
Tuberculosis, active pulmonary	12	1
Others	331	26
	1,272	

ances and residual states, over-sensitivity, and immaturity.

Physical health, male or female, college department, or intellectual rating seem to have no significant relation to cases.

Allergy

For about seven years, one staff member has given attention to sensitization and has used the scratch test for two hundred materials as routine testing. Over 6% of the men and women, nearly 4,000 students, have been so tested.

Strong reactions were as follows, to pollens 31%, to foods 13%, to epidermals 9%, to bacteria about 2% and miscellaneous the same. There were no reactions in 33%. Intradermal tests were advised for 58%. Cases were mostly refers and others selected upon the basis of history in new students. One hundred students with entirely negative histories gave essentially negative reactions.

In the treatment of four hundred cases of hay fever, the patients later reported in percentage of improvement, the value of the treatments, as shown in Table No. VII.

Refractions

About 15% of these students receive complete eye refractions annually as a result of requests which come without particular stimulation. There is no significant sex difference. About 35% are first refractions as a result of which glasses are advised for 88%. Of those

Refer service at the University Hospital provided care for psychiatric situations until about 1930, when a staff unit was added. Students are now evaluated for personality upon entering college and their future experience shows high validity in the rating. The program in mental hygiene has been largely confined to attention to cases which total 10% of the student enrollment annually. Of these cases about half request the service on their own initiative. The interviews average 18 per patient, 8 of which are with the patient himself. The other interviews are with interested persons such as faculty, relatives, etc.

About half of the situations are maladjustments not significantly clinical; a third are psychoneurotic; and psychoses average about 2%. A fourth of the situations are acute and urgent and 75% are disposed of in the first year. It is possible to treat 70% of all cases with 85% satisfactory result. A fourth of the cases are not severe, but disabling and amenable to help. Suicide indications are present in 6% of the cases.

The leading basic situations in order of frequency which bring students for this service are excitability and tensioned response, worry over school work, poor orientation, instability and over-impulsiveness, physical disturb-

TABLE No. VII—HAY FEVER TREATMENTS
Percentage Improvement. Averages of Five Year Records.
402 Cases.

Percentage Improvement (Patient estimate)	Percentage Of Cases
100 per cent	11.
75 per cent	61.
50 per cent	82.
Some, but less than 50 per cent	18.
None	5.

requesting first refraction, 96% complain of symptoms. Compound hyperopic astigmatism makes up 38% of over 15,000 diagnoses of refraction errors and is followed in order by simple hyperopia 18—%, compound myopic astigmatism 18—%, simple myopia 13%, mixed astigmatism 6%, simple hyperopic astigmatism 5%, and simple myopic astigmatism 2%.

Tuberculosis

The trend rate for active pulmonary tuberculosis has remained at about two per thousand enrolled students annually. This steady rate with the general decline of the disease is explained by the increased emphasis on early case finding. Considerable study of experience with this disease has been made.

An analysis of cases for a recent five year period shows over 60% minimal at first recognition. That checks well with the findings of routine chest X-rays of all new students last fall. Cases by departments rank, in order of frequency, in medicine, graduate, engineering, dentistry, law, and literary. There is almost ten times as much active tuberculosis among students from overseas, particularly Chinese, as in the native group. College freshmen have less disease than transfers and other older new students.

The search for cases mostly in the clinic during seven recent years has resulted in a gradual annual increased use of chest X-rays. The annual percentage of chest X-ray for the total student body has increased in seven years from 15% to 41% for women, and from 5% to 25% for men.

The early readings of 3,300 flat chest films of entering students for lungs last fall are indicated in Table No. VIII. Developments during the year indicate little change in the validity of these findings.

The death rate given in Table No. I are not over a third of the rate for the same age group in the general population and deaths have been counted for all persons enrolled regardless of where, when, or why the death resulted. This favorable rate may be partly the result of the health program, although other special factors must be considered. Since the control of the student use of automobiles, accidental death rates have been lower.

Contagions

The usual contagious diseases are not a very serious problem in this student group, which is largely urban and has apparently previously acquired a high degree of immunity. Vaccination is required of all.

TABLE No. VIII.
Preliminary Readings of a Rapid X-Ray Survey of Intrathoracic
Tuberculosis on 3,300 Student Entrants.
Rates are per 1,000 examined Fall 1935 *

Items	Men	Women
	Rate	Rate
1. Gohn's tubercle	51	55
2. Calcification, parenchymal, other than Gohn's	12	6
3. Pleural calcification	0	0
4. Hilar calcification	62	53
5. Hilar and mediastinal glands T.B. non-calcified	1	0
6. Parenchymal infiltration	8	7
7. Cavity	(1 case)	(1 case)
8. Except as above (not calcified parenchymal scar)	(1 case)	(1 case)
Total	133	123

*X-ray examination of all new students the fall of 1936, gave essentially the same results.

Reports

Regular reports feature selected items monthly and give more complete data annually. Many requests for special data are received, and papers by staff members have dealt largely with statistical summaries from departmental records. From some such tabulations, certain relationships appear to exist.

About one half of the students report annually for attention for an average of two upper respiratory infections each; men more than women. No relationship can be shown between the incidence of such infections and attacks of acute appendicitis. No significant difference in any of the many other items of a complete medical history and examination could be shown between persons reporting at the clinic for maximum number of colds and those reporting for none. The condition of tonsils seems to have more relation to enlarged cervical lymph glands than have decayed teeth or history of devitalized teeth. Many tabulations fail to reveal any very significant factor in dysmenorrhoea. The presence or absence of tonsils in our students as a whole seems to be a determining factor in no other important question of health.

Students on scholastic probation have more hospitalization, more room calls, more tonsils, and less history of allergy than control groups.

One finds no statistical evidence of improved health for men students taking a two hour a week required program in physical education. After an average of five years following tonsil operations done here, the patients reported improvement in 80% of the cases; 55% reported improvement after sub-mucous resections. Infant nursing or bottle feeding history could not be shown to make any difference in the health of men students studied.

The analysis of 107 recent cases of pneumonia shows absence of leucocytosis to be of no prognostic value in non-complicated cases, X-ray and physical signs may reveal bronchopneumonia without fever, and clinical

signs may antedate X-ray confirmation by as much as two days.

Problems

In consideration of one's ideals it may be said that there are many problems in the department, but viewed from other angles one might defend the position that there is none of major concern.

The rapidly increased demand upon the department for the highest type of extensive clinical service has limited the program of health education and health promotion. The development of a sufficient staff and adequate space for the desired program of annual, time consuming, personal, health examinations and conferences is yet to be realized here.

The continued growth of requested service in old and new fields has made it so far impossible for us to say how much modern medical service is needed for a population of comparatively healthy young adults. Lack of building space, budget limitations, and inadequate measures of values, may be listed also as problems.

Conclusions

Twenty years of experience seem to have established a student health clinic at the University of Michigan as a satisfactory method of handling medical problems for its student group.

The University-controlled clinic meets several health necessities in a student population for which provision is not otherwise made.

Clinical data from years of experience are summarized covering a wide range of considerations.

The desirable future development of such departments in colleges should be in the direction of the objectives for which such institutions are primarily maintained.

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Aural and Nasal Problems in General Practice*

Frank L. Bryant, M.D.**

Minneapolis, Minnesota

Cerumen

AS A GENERAL RULE, the patient who has wax periodically removed presents no special problem. Occasionally, one does see a patient with small ear canals, in which the cerumen has become very dry and impacted. Ordinary syringing in this instance has no effect; and attempts to remove it by curet or ear-spoon are too painful. More often, it cannot be done. With such a patient, it is better to instruct him to use softening drops three or four times daily for two or three days before a removal is attempted. Once the cerumen is softened, it is easily removed by syringing it out with warm water. One may use either warmed olive oil, or a prescription containing sodium bicarbonate Gr. xx in equal parts of glycerine-and-water to make one ounce. After removal of the bulk of the wax, the ear drum should be examined to determine its condition. Sometimes, a small flake of wax may adhere to the tympanic membrane, thus impairing the hearing until such time as it is removed. Patients of this type should be advised to have more frequent check-ups, in order to preclude a recurrence of such a condition.

Foreign Bodies

Most foreign bodies (if they are lying free in the ear canal) can be removed by syringing the canal, or by a small tenaculum alligator ear forcep. But if someone

in the patient's home has attempted to remove the offending object, there may be so much trauma and edema that the object has become impacted. Further attempts may be too painful, no matter how much care is exercised by the physician. In such a patient, it is necessary to give a general anesthetic; and this is especially imperative in children. Under such narcosis, removal of a foreign body is greatly facilitated, and good opportunity to examine the ear drum for possible injury is presented. If the foreign body is alive (*i. e.*: an insect), it may be removed by irrigation, since an insect often clings to the ear's canal wall, where water will easily reach it. A one-half per cent solution of liquor cresolis saponatus (lysol) should be instilled; or a pledget of cotton saturated with chloroform should be placed in the outer one-third of the canal. Chloroform should never be poured directly into the ear canal: it is too painful. A solution of one gram of glycerine with three drops of phenol likewise can be employed.

If, however, the foreign body has been pushed through the ear drum, a retro-auricular incision should be made. Removal is then done more easily through the site of the perforation.

Eczema

Eczema is a fairly common condition. It is not painful; but it often annoys the patient greatly, and may thus predispose toward more serious conditions. The patient may present himself with the ear canals in an irritated or inflamed state; it is even possible that in an effort to relieve the itching, he has perforated the ear

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** Instructor in Otolaryngology, University of Minnesota Medical School.

drum with a sharp instrument. The indiscriminate use of a toothpick, bobby-pin, or proprietary ear oils, *etc.*, may favor the development of a fungus infection. When a general examination to determine the presence or absence of allergy, intestinal conditions, and kidney disease, is not done, these two prescriptions may be helpful:

- I. **R** Ung. Amm. Hydrarg. 5%
Sig.: Apply to ear canals b. i. d.
- II. **R** Phenolis gr. VIII.
Acid salicylate Aristol ad. gr. X.
Lanolin, ung. Zn. oxidi ad. IV.

Fungus Infection

The use of ear oil, as has been stated, often predisposes to more serious conditions. The patient has an itching in the ears, and complains of a sensation of fullness, and a discharge. Examination reveals the discharge to be a brown, a black, or a yellow color, possessing a sweet, sickening odor. This can readily be cleansed by using alcohol-soaked cotton applicators. Painting the ear canals at intervals of two to three days with AgNO_3 , 5 per cent to 10 per cent, or with one of the germicidal tinctures, is usually curative. The patient obviously must discontinue his home treatment with ear oils, and he must prevent the accumulation of moisture in the ear canals through washing, *etc.*

Furunculosis

Boils of the ear canal, with diffuse inflammation, are very painful. Sometimes, this condition is mistakenly called mastoid infection because it is deep-seated and severe. The patient with furunculosis usually offers a negative history of upper respiratory infection; more likely, he has been swimming in water which was high in bacterial content, or he has been irritating his ear canal with a match, toothpick, *etc.* An examination reveals an inflamed ear canal which is almost completely closed, and which will not permit the insertion of even a small ear speculum. Any manipulation of the auricle is extremely painful. This is due to the swelling of the sub-dermal tissues, and to extension down between the cartilaginous tissues of the external ear canal.

Treatment. Avoid an incision, if it is at all possible. If the inflammation is diffuse, hot epsom salts compresses are indicated. A small gauze wick saturated with cresatin, ichthyoldine, or camphor phenol, is inserted very gently and cautiously. The otologist may not be able to insert the packing very far the first time. Any secretion should be gently removed at least twice daily, and drops instilled; or a clean medicated pack should be re-inserted. Foreign protein injections are helpful. The patient should be instructed to use a liquid diet, because chewing aggravates the pain, owing to movement of the condyle of the mandible. If the patient has had two or three attacks, the staphylococcus toxoid in graduated doses is a helpful prophylactic measure. Some have used an autogenous staphylococcus vaccine with success.

Acute Otitis Media

This condition may result from external or internal causes. Some of the common causes are: a perforating

injury to the ear drum, skull fractures, re-infection through an old unhealed perforation, *etc.* Internal causes may be an extension *via* the Eustachian tube from an upper respiratory infection, severe nasal douching, acute infectious diseases, influenza, or tonsillitis.

Symptoms are a stuffiness in the ear which may range to deafness, a gradually-increasing throbbing pain, echoing in the ear when the patient talks, and fever and malaise. Examination reveals an ear drum diffusely reddened, with obliteration of the normal landmarks. Insertion of the ear speculum gives no increase in the pain. If there is a definite redness and a bulging, myringotomy is immediately indicated. The opening is best made under a general anesthetic. The patient should be kept in bed under the prescription of a light diet and such general measures as are indicated. If the nose and throat show involvement, as they very often do, such treatment should be done as is needed. Occasionally, the otologist encounters a patient after the eardrum has ruptured; and in this instance, the discharge must be removed in order to determine the size and location of the perforation. In a great many cases it will be small; here a myringotomy should be done. This will permit a more unimpeded flow of discharge, and will also minimize further destruction of the tympanic membrane. It will also allow better restoration of the eardrum after healing commences.

Treatment during the acute stage consists of instillations, irrigations, or dry wiping with cotton applicators. The "dry wipe" method is favored by many otologists. It must be done regularly and thoroughly if any success is to be achieved through it. Often, the physician will leave a small pledget of cotton in the ear canal; this must be removed and changed before it becomes saturated. If it remains in the ear canal long enough to become saturated with the purulent discharge, it thereafter functions as a very definite barrier to satisfactory drainage.

The clinical course of a patient with acute otitis media runs from two to twelve days or more. It may resolve completely within this period, or it may extend a few days longer. If the patient gradually exhibits less discharge, sleeps more restfully, and requires little or no analgesics, one may assume that the healing process is in action. If, however, after ten to fourteen days, the examination reveals an angry-red eardrum, and if a definite pulsation is seen in the middle ear when the pus has been thoroughly cleansed, the prognosis will be less favorable.

If the discharge appears to "well up" while the physician is observing the tympanic membrane, a diagnosis of mastoiditis may be made safely. The physician ought also to watch for redness and swelling in the posterior superior portion of the osseous section of the ear canal, for these are the two earliest signs of extension of infection into the mastoid. It is dangerous to wait for a drooping ear, a prominent ear, or for pain and tenderness over the mastoid tip in arriving at a diagnosis. If these signs do occur, the diagnosis is only the more obvious. The X-ray at this time should show a variable

amount of bone destruction; and dependent upon these and other general findings, the physician should be able to judge whether or not the condition is a surgical or non-surgical mastoiditis. If the patient, in spite of mastoid involvement, shows no pain of any consequence, if he has little or no fever, and if his general condition is good, the physician is justified in waiting; but it should be watchful waiting.

If, on the other hand, pain occurs and is not relieved by the usual doses of codeine or morphine, if the patient is restless and sleeps poorly, and is in general *sick*, surgery is called for. It is true that many patients who are not operated upon do recover from the acute condition, and apparently return to health. The fact that they *seemingly* return to health is emphasized, for too often their ears continue to discharge. These individuals form the legion of patients who have what is called a "chronic running ear," or who have exacerbations of ear-aches concomitant with discharge.

These are the patients who gradually lose their hearing, who are forced to be careful about catching cold, who may occasionally display polyps and granulation tissue in the ear canal, and in whom the usual ear drops have little or no effect—certainly not a permanent effect. It is these patients who should have had a mastoidectomy at the time of the acute condition.

Significance of Chronic Running Ears

The physician ought to assume that every patient who has a chronic purulent discharge from the middle ear (either continuous or rather periodic), and who has almost a complete loss of the ear drum, has a chronic mastoiditis. Any patient who complains of pain, and who has chronic otitis media, is a patient demanding careful and repeated examinations. A patient exhibiting a purulent discharge in which the otologist can feel a gritty substance likewise must be thoughtfully observed. The ear drum and the middle ear cavity serve as excellent diagnostic indices to the state of affairs obtaining. There are, in general, three types of perforations: central, marginal, and Shrapnell's. They are of importance as indicated below:

1. *Central* perforations occur in the center part of the membrana tensa of the ear drum. Such a perforation as a rule offers a better prognosis for conservative management. Two prescriptions which may be used are these:

R Calot's solution	
Guaiacal	1.0
Creosote	5.0
Iodoform	10.0
Sulphuric ether	30.0
Olive oil	70.0

Misce et signa: guttae V
into ear b. i. d.

R Acidi borici	2.0
Spiritus Vini Rect. 70%, q. s.	30.0

Misce et signa: guttae X
into ear b. i. d.

If upon examination, disease in the nose, throat,

or sinuses is discovered, suitable and adequate treatment should be instituted.

2. *Marginal* perforations (or peripheral perforations) usually indicate an osteitis at the particular site of the periphery. There is often a growing-inward of the skin from the ear canal at the expense of the mucous membrane of the middle ear. Cholesteatomata subsequently form, due to the inability of desquamated skin to come out. Several cholesteatomata may form; these in addition to the osteitis may constitute sufficient indication for mastoid surgery.

In some patients, examination will show almost a complete loss of the tympanic membrane, with granulation tissue and purulent exudate. The history of repeated exacerbations of mastoid inflammation substantiated by changes in the X-ray of the area means surgery is the only expedient.

3. Perforation in *Shrapnell's* membrane (the membrane flaccida) is often indicative of an inflammatory process extending over the entire middle ear. Frequently the onset is insidious, being discovered only after a very careful routine examination. Conservative treatment is of doubtful value in this type; often a patient with such a condition must ultimately undergo mastoid surgery before cure is achieved.

Infections of the Nose and Sinuses

In the consideration of the management of a sinus disease, a review of the anatomy and physiology of the nose is important to a better understanding. A few essentials may be pointed out here.

The nose is the chief portal through which air reaches the lungs. It is therefore situated at a crucial location, and being so situated, it has two important functions in this relation to perform: that of an (a) air-conditioner, and that of an (b) air-filter.

The internal configuration of the nose is peculiarly adapted to these functions. The air column is not straight; but is rather irregular and curved. The air itself as it passes through the nose is broken up into numerous eddies and currents by the formation of the turbinates and the septum. It therefore comes into contact with much more of the surface area of the mucous membrane. Nevertheless, the greater part of the air inspired is not fit for use by the lungs; just as food ingested is not ready for use by the body until it has been digested. The air is conditioned—that is to say, it is warmed and moistened. Each of us remembers how the nose becomes stuffy in a hot, dry room. In an effort to impart enough moisture to the too-dry air being inspired, the turbinates enlarge at the expense of the nasal space. Each of us can remember having what we once called a "runny nose," after having been out in the cold air for a period of time. In this particular instance, the air is so cold that all the moisture given off cannot be evaporated and utilized; and hence, collected. If the nose be examined at this time, the turbinates will be very red, indicating

the efforts of these structures to warm the air and insure a more abundant secretion.

Most of us, also, can remember how clear the atmosphere seems, and how clear the nose seems, after a heavy rain on a summer's day. In this case, the temperature probably is from 70 to 80 degrees, and the relative humidity at least 40 to 50, possibly higher. Optimum conditions exist. The nose has little actual work to do. The temperature of the air is what we should call "almost normal"; that is, for ideal metabolic requirements. Now, the normal temperature of the turbinates is about 90 degrees, and if the humidity of the atmosphere is from 40 to 60, it permits the turbinates to recede, allowing freer nasal breathing.

The turbinates are covered with a ciliated epithelium. Dust particles, bacteria and pollen which are too minute to be enmeshed in the hairs or the vibrissae acting as the first line of defense just inside the vestibule, are filtered out by these cilia. The nasal cilia have a wave-like, rippling action; they are partially covered by a layer of protective mucous, and function best in a temperature of from 70 to 90 degrees. Lower temperatures and dry air gradually reduce their activity, thus permitting lessened efficiency.

It is likewise true that a diseased organ is a less efficient one. Hence, particular emphasis should be placed upon this phase in the treatment of all nasal conditions.

From the foregoing, it is possible to appreciate the responsibility of the nose to the lungs, as well as to the throat, trachea, and bronchi.

When disease exists in the nose, the symptoms are of course those due to an altered physiology. That is (a), changes in the discharge; it may be too scanty, too heavy, or too thick, ranging from mucoid to catarrhal or purulent; (b) changes in the nasal space, stuffiness to complete stoppage, either temporary or transitory, or more or less permanent; (c) changes due to swelling of tissues, and backing-up of the secretion; head-ache, neuralgias and, (d), reflex disturbances arising from pressure.

A diagnosis should be made only after a careful history has been secured. This history should include information regarding (a) the nasal discharge—character, amount, and duration, (b) nasal obstruction—the de-

gree, side of, and duration, (c) head-ache—location, severity, relation to nasal discharge, and to nasal stuffiness, (d) frequency of upper respiratory infection—i. e.: colds, sore throats, and pharyngo-tracheobronchitis.

A rhinoscopic examination with a focused reflected light, a posterior rhinoscopy (using a suitable mirror in the mouth) and trans-illumination of the sinuses should be done routinely.

Many physicians believe that if a patient has a chronic sinus infection, pain must be present. It is true that pain usually is a complaint in a patient with an acute sinus infection. Nasal discharge and nasal obstruction occupy second and third places, respectively, in the symptomatology. In chronic sinus disease, however, a nasal discharge which is usually mucopurulent and persistent, is the outstanding complaint; in fact, this is really the so-called "catarrh" of the nose of our grandfathers' day. Second in incidence is nasal stuffiness or obstruction unrelieved or only temporarily helped by nasal oils or local nasal treatment.

When a patient with a chronic sinus infection catches a severe cold in the head, the sinus infection is thereby exacerbated, and pain occurs. Pain at this time becomes sharp and more severe; and it is in a closer relationship to the nerve supply of the sinus primarily involved. When the middle turbinate becomes inflamed and swollen to such extent that it presses against both the septum and the inferior turbinate, obliterating the middle meatus (which is the drainage zone for the frontal maxillary and anterior ethmoid group of sinus cells), the patient complains of a dull, constant head-ache, relieved somewhat by acetysal, or by removing some of the discharge.

Conservative and supportive treatment should be instituted in those patients with acute sinus infections. Moist heated compresses, various forms of fever therapy, suction drainage, and general symptomatic treatment, form the main aids. Surgical interference should be restricted to simple drainage procedure when indicated.

On the other hand, in those patients who have a long standing chronic sinus infection, where marked changes in both the nasal cavity and in the sinuses have occurred, only a thorough exenteration will effect a cure.



Silicosis and Other Dust Diseases*

Albert E. Russell, M.D., F.A.C.P.**

Washington, D. C.

THE public today is no longer mystified when it hears silicosis mentioned; however, it is frequently spoken of as "the new disease." As a matter of fact, diseases due to dust and to lead are the oldest known occupational diseases. We find references to them in literature before the Christian era, and there is a classical description of silicosis more than 200 years old. Apparently, there is less silicosis today in proportion to the number of industrial workers than there has ever been; however, it is more widely-known than at any time in history. There are two reasons for this latter fact; one is that the public is more health-conscious than ever before, and second, silicosis has become such a medico-legal problem in the last few years as to merit wide publicity. There is scarcely a large city in the United States that has not had a siege of silicosis suits.

The disease "silicosis" is a condition of the lungs due to the inhalation of particulate silica dust. It will occur anywhere that prolonged exposure to silica dust takes place. The extent of the disease depends on several things, the most important of which are extent and length of exposure, and type of dust. The presence of a latent tuberculous infection is a great factor in the course of the disease and in its prognosis. Silicosis is seldom a fatal disease without being complicated by tuberculosis; and when tuberculosis is present the physical and clinical picture is quite different from simple, uncomplicated silicosis.

Occurrence

The most abundant constituent of the minerals and rocks that make up the earth's crust is silica; most of this, however, is in a combined form. Quartz is the most common form of free or uncombined silica, and occurs in granite, flint, schist, sandstone, quartzite and other rocks. It is a hard mineral and is resistant to the action of reagents. Many ores are found in rock that consists largely of quartz; this is particularly true of gold. Opal, amethyst, chalcedony, onyx, agate, carnelian, and other semi-precious stones are forms of quartz.

When we consider that silica is so abundant in the earth's crust, it is not surprising that the silica hazard is so widespread in industry. It is met with in occupations in mining, quarrying, tunneling, and those connected with industries concerned with the processing of mineral products. Some of these are: use of sand and gravel, stone-dressing, manufacturing of abrasives, sand-blasting, grinding, moulding, ceramic processes, smelting, refining, *etc.* The most common forms of silica met with in industrial processes are crystalline quartz, sandstone,

flint, tripoli, diatomaceous earths, and sand. Most of the industrial dusts are inorganic, and incidentally, they are the most harmful.

The following list shows the widespread uses of silica in industry:

- Abrasives.
- Sand paper.
- Sand-blast work.
- Metal-buffing.
- Sawing and polishing of stone.
- Whetstones, grindstones, *etc.*
- Tube mill linings.
- Lithographer's graining sand.
- Tooth powders and pastes.
- Wood-polishing and finishing.
- Refractory uses.
- Metallurgical (silicon alloys).
- Smelting (as flux).
- Foundry—mold wash.
- Foundry—parting sand.
- Chemical industries (lining acid towers).
- Filtering medium.
- Manufacturing of sodium silicate.
- Manufacturing of carborundum.
- Paint: as an inert extender.
- Mineral fillers.
- In fertilizers.
- Insecticides.
- Rubber filler.
- Asphalt (surface mixtures).
- Ceramic (potteries).
- Glass.
- Manufacturing of chemical apparatus.
- Decorative materials (gems, crystals, vases, *etc.*)
- Insulation (rockwool).
- Structural materials.
- Optical quartz.

The U. S. Bureau of the Census reported that there were approximately 14,000,000 persons gainfully employed in the United States in the manufacturing and mechanical industries in 1930. Bloomfield¹, in a recent survey in a large manufacturing center, showed that about nine per cent of the industrial workers were employed in occupations where the silica hazard required consideration. If his survey is representative of the occupational distribution of workers, it appears that there are slightly more than 1,300,000 persons potentially exposed to a silicosis hazard in the manufacturing and mechanical industries alone. One-fifth of the workers, or about three million persons, are exposed to inorganic non-metallic mineral dust.

Etiology of Silicosis

The etiology of silicosis is prolonged exposure to high concentrations of silica dust. It has been shown that

*Harold S. Boquist Second Memorial Lecture, given at the University of Minnesota Medical School on December 3, 1936. Approved for publication by the Surgeon General of the U. S. Public Health Service Bureau.

**Surgeon, U. S. Public Health Service.

silica (SiO_2) alone produces more permanent pulmonary damage than all other elements found in industrial dust. Originally, the dangerous properties of dust were thought to be dependent on certain physical characteristics, such as hardness, sharpness, and angularity of particles. This theory, however, has been abandoned, generally, in favor of the chemical action of the dust.

The silica particles in the alveoli stimulate phagocytosis. According to Fallon and Banting², the particles are taken up by histiocytes which multiply in the surrounding tissue and migrate into the alveoli, collect the particles of silica dust and remove them into the lymphatic channels and nodes. These cells tend to collect into aggregates in the lymph channels and nodes, thereby forming obstructive lesions. In this way there occurs an accumulation of dust in the intrapulmonary lymphatic tissue. Apparently silica becomes soluble after being deposited in the tissues, and produces cellular proliferation. It was agreed at the International Silicosis Conference³ that "there is experimental evidence that the solubility of silica in the tissues is an essential factor in the causation of silicosis." In time, the silica particles undergo a gradual dissolution, and thereby stimulate an excessive production of fibrous tissue, forming the characteristic nodule of hyaline fibrous tissue. Degeneration takes place in the nodules, and the proliferation of fibrous tissue takes place at the periphery, increasing the size of the nodule. These nodules coalesce as they increase in size, and bring about areas of massive fibrosis in the lung. Grossly, the nodules appear as small pearly bodies two to three millimeters in diameter, and when cut, pigmented foci may be seen on the surface. The lymph nodes are enlarged and deeply-pigmented, and are fibrous and indurated. In later stages, large nodules are formed by the coalescence of smaller ones, and there are emphysematous areas between them. The lymph nodes are enlarged and pigmented and present a gritty sensation on being cut.

Infection of the lung with *B. tuberculosis*, whether it occurs before, simultaneously with, or subsequent to, the development of silicosis, alters and unfavorably influences the course of the disease.

Kettle⁴ gives an explanation as to why tubercle bacilli proliferate in the necrotic center of the silica lesion, naming the following reasons: "first, the mere mechanical protection of bacilli during their early lodgement in the body; second, the rich pabulum furnished to the disintegrated cells; and third, the stimulating action of silica on the growth of the bacilli." It is also well known that tubercle bacilli grow well in a medium rich in colloidal silica. His final opinion as to why silica dust is dangerous, as far as the production of tuberculosis is concerned, seems to be that it is not because of the fibrosis produced by the silica, nor because of the damage which silica does to the lymphatic system, but simply because of the presence of silica in the lung.

Collis⁵ calls our attention to the fact that when excessive mortality rates from phthisis in dusty occupations occur, they are always found to be associated with exposure to dust containing crystalline silica. In this con-

nection, the mortality from tuberculosis among granite workers in Vermont was found to be 1900 per 100,000, while the mortality of marble workers from the same cause in the same state is below that of the males in the general population. The type of work and the economic conditions of these two groups of workers are very much the same.

Knowledge of the petrography of dust is necessary in estimating its effects on workers. The following examples are good illustrations as to why chemical analyses should not be relied upon solely for this purpose. The chemical analysis of cement dust indicates that there is 15.2 per cent silica present, while the petrographic analysis shows that it contains only 1 per cent of free silica or quartz. It has not been shown that silicosis occurs from exposure to cement dust. The chemical analysis of granite indicates that there is approximately 70 per cent silica present in it, while by petrographic analysis only 30 per cent of quartz is found. During recent years much attention has been given to the rôle of sericite, a potassium aluminum silicate in the form of a secondary mica, as the damaging element in silica dust. It has been definitely proven, experimentally, that it is not the harmful element in dust.

The reported absence of silicosis in the Kolar gold mines in Mysore province in India were cited as a support to the sericite theory. The absence of silicosis among the workers was reported to be due to the absence of sericite in the gold-bearing rock, in contrast to the great incidence of silicosis in South Africa where sericite is present. Dr. S. Rubba Sao, Mysore Government medical officer, reports that the free silica in the Kolar rock is only 5 to 20 per cent, as compared with 43 to 98 per cent in the South African rock. Dr. Sao reported that silicosis was found among the underground workers, and sent X-ray films and pathological specimens to the South African Institute, where the diagnoses were confirmed. Obviously the disease would develop much more slowly as would be expected when we consider the low silica content of the Kolar rock, and also that the mines are reported to be well-ventilated.

Irvin⁶ showed that sericite can remain in the lung, lymphatic or subcutaneous tissue for a year without producing anything but a foreign-body reaction and show no evidence of physical change in the tissue fluids. He also found fibers of sericite in the pulmonary lymph glands of non-silicotic individuals, and they were not associated with any fibrosis. Fallon and Banting⁷ also found that the tissue reaction to sericite is comparable to that produced by innocuous substances, but not to that of free silica.

Concentration and size of the dust particles is a part of the etiology of silicosis and ranks with equal importance to the chemistry of dust. It is necessary to know the concentration of a dust before a definite decision can be made that such a dust is harmless. A toxic dust in low concentration may not produce a disabling silicosis, but when the threshold of tolerance is passed, the disease will develop at a rate proportionate to the concentration and the percentage of free silica present

in the dust. In the Vermont granite plants, it required about 15 years for silicosis to become established and a longer period before disability became evident unless tuberculosis became a complicating factor.

So far as the size of the particles is concerned, it is apparent that in order for any given dust to produce injury, it must gain access to the parenchyma of the lungs, the site where the harmful effects of the dust take place. All of the particles of inhaled dust do not gain access to the lungs, and are not necessarily retained in case they do reach the alveoli. The respiratory system has been provided with certain equipment for the purpose of keeping out foreign matter. Dust particles that gain access to the alveoli may be coughed up before being removed by phagocytosis. Several have shown that it is rare to find a particle of dust in the lungs of deceased persons that is more than ten microns in diameter, and that the majority of them are considerably smaller. This is possibly due to the fact that the number of particles larger than ten microns in dust is small when the lower size range is considered. Gravity causes a more rapid settling of suspensions of the larger-sized particles, also, these particles are easier to catch with the respiratory protective equipment. It is obvious that we must concern ourselves with particles that are less than ten microns in diameter.

Clinical and X-Ray Characteristics of Silicosis

When considering the clinical aspects of silicosis, it is necessary to bear in mind that it occurs in uncomplicated form (simple silicosis), and with infection. The latter is almost invariably tuberculosis. The physical and clinical aspects of the disease will be quite different in each case. Uncomplicated silicosis is not accompanied by toxemia, and the course of the disease is quite different when tuberculosis is absent. The patient may be able to continue his work and usual routine without much inconvenience. He is usually well-nourished and apparently healthy, unless in an advanced stage of the disease.

Physical examination will reveal some limitation of chest expansion; and unless the patient has engaged in athletics, the extent of limitation is usually in proportion to the length of service. The restriction of expansion was found to be symmetrical, in contradistinction to the asymmetry found in pulmonary tuberculosis, uncomplicated by silicosis.

Dyspnea is usually the first complaint, and is quite constant in silicosis, increasing with length of exposure. It was my experience in the study of the Vermont granite workers that if silicosis was well-established, and the worker changed to non-dusty occupations, the dyspnea increased as time went on. Pains in the chest were a common complaint; however, none was of sufficient severity to warrant the consultation of a physician.

Patients with uncomplicated silicosis usually have a non-productive cough, which seems to cause them no inconvenience. They do have frequent colds, however. Physical examinations usually revealed a general im-

pairment of resonance over the chest, the intensity varying as a rule with the length of dust exposure. This finding is consistent with the character of the generalized fibrosis of the lungs in silicosis. The fibrosis of tuberculosis is localized over the infected area, whereas the fibrosis of silicosis is general throughout the lungs. It is easy to overlook the impaired resonance, since it is general, and there are no local areas to afford a contrast in percussion note, as is the case in tuberculosis and pneumonia.

In my cases of granite-cutters there was no marked change to any particular variety of breath sounds in uncomplicated silicosis. There was, however, a general softening (or "soft pedal" effect) on all the breath sounds, which naturally accentuated the vesicular type of breathing. Riddell¹ states that "The commonest change is in intensity. Breath sounds in silicosis tend to be distant or blanketed." Râles were absent in uncomplicated cases. No toxemia was present, which is accounted for by the absence of infection.

Silicosis Complicated by Tuberculosis

Our experience with the granite-cutters in Vermont led us to the conclusion that workers who have a latent tuberculosis become disabled with silicosis earlier than the average individual. The rate of development of silicosis seemed to be more rapid, and the tuberculosis complication came about when they were yet young men. This was not the case in persons who had developed silicosis in the usual manner. The average age of this latter group was 49. The course of tuberculosis in this instance was more rapid and went to an early fatal termination. The average duration of illness was about 15 months.²

Early Manifestations of Infection

Silicosis with beginning tuberculous infection is not easy to diagnose with X-ray methods alone. Advanced silicosis and early tuberculous complication may give similar appearances in the X-ray film; however, when tuberculosis has advanced, the picture is quite different. It was our experience that the patient complained of fatigue, rapid loss of weight and strength, night sweats, increase in dyspnea, more severe pains in the chest and often a very painful pleurisy (in some instances requiring opiates to alleviate), and an afternoon rise in temperature. The cough was usually more severe and became productive. In our cases it was easy to find tubercle bacilli in the sputum when the above symptoms were present; many of the patients had hemoptysis, and later in the disease there were frank hemorrhages from the lung. Several died from severe pulmonary hemorrhages. As the disease advanced it presented no great differences from those fulminating types of uncomplicated tuberculosis.

The physical signs of tuberculosis complicating silicosis presented variations from those in uncomplicated cases, inasmuch as general pulmonary fibrosis already existed. When consolidation and cavitation occurred, the signs were similar to the usual case of tuberculosis. The

latent or post-tussic râle was constant and not unlike the same valuable sign of uncomplicated tuberculosis.

It is necessary in the diagnosis of silicosis to take into consideration:

- (1) The employment history in detail.
- (2) Symptoms and physical signs.
- (3) Radiological findings.

X-ray gives more evidence of pneumoconiosis than any other single method of diagnosis. In fact, no diagnosis of silicosis is complete without it. X-ray characteristics are so pronounced that it may easily become a habit to omit other procedures in the diagnosis. The physical examination is very important in this respect. There are other pulmonary conditions which may closely resemble silicosis, and care must be taken in all cases to establish a history of exposure to silica dust.

The X-ray characteristics of silicosis may resemble asbestosis, mycotic infections of the lung, and also military tuberculosis and tuberculous broncho-pneumonia, as well as passive congestion of the lung and bilateral bronchiectasis. Certain metastatic malignant conditions of the lung may show a resemblance to silicosis by X-ray. Occasionally X-ray films of silicosis will show a deviation from the usual picture. This emphasizes the importance of the history of the patient. His whole occupational life should be accounted for in detail and particularly those occupations in which there was dust exposure.

X-Ray Characteristics

When the pathology of silicosis is taken into consideration, it can readily be seen that an X-ray of the chest will show a generalized fibrosis. The dust is deposited in the lymph channels and nodes along the bronchioles, bronchi and hilus, and naturally the pathology of the disease will be located in these same places. The body's response to silica dust is the formation of fibrous tissue, and this is indicated on the X-ray as a generalized thickening of shadows in the parenchymal portions of the lung. There is a predominance of shadows in the lower middle portions and on the right side. The dust enters the lung in a downward direction, and reaches the lower middle portions before it is arrested on the moist walls of the bronchi and bronchioles. Therefore, very little dust reaches the apical portions. The right bronchus is larger than the left and enters the lung at about a 24-degree angle, whereas the left bronchus, the smaller one, enters at an angle of about 45 degrees, and the dust is more readily arrested by impingement against moist walls of the pulmonary structures before it reaches the bronchioles. Riddell,⁸ in speaking of nodular shadows says, "It tends to be rather evenly distributed throughout the lung fields, but primarily appears in the mid-zones about the lung roots and is often of greater intensity on the right side." It was my experience at autopsy to find very dense pleural adhesions. In one case where there was exposure of only three years, there were marked adhesions. We found evidence of adhesions marked by irregularity of the diaphragm in many cases and it was quite consistent

in the more advanced cases. This is evident in the X-rays reproduced in *Bulletin 187*.

Briefly stated, the X-ray appearance of an early (first stage) case of silicosis is as follows: There is an increase of the linear shadows radiating from the hilus, and in the course of these, there occur discrete densities indicative of nodule formation. The apical portions are usually clear.

In the second stage, there is a further increase in the bilateral markings and in the number and size of the discrete nodular shadows. There may be evidence of confluence of the nodules. Evidence of pleural adhesions may occur, shown by irregularity of the diaphragm.

In the third stage, there is marked accentuation and confluence of the above-mentioned shadows, and there may be massive areas of consolidation and irregularity of the diaphragm.

Silicosis Complicated by Tuberculosis

Tuberculosis may become a complication in any stage. It occurs with increasing frequency as the disease advances. Bohme¹⁰ observed a group of 300 patients with silicosis. He found that after five years more than one-half of them had died, and that 72 per cent of the deaths were due to pulmonary tuberculosis. The X-ray findings usually show an accentuation of the markings described above with a loss of their distinct character or lineation. There is a tendency to flocculence, and areas of conglomeration and consolidation form as the disease progresses. There may be cavitation in advanced stages. Pleural changes may be shown on the X-ray film. The tuberculous lesion is not always in the apical portion, as in uncomplicated tuberculosis. The majority of the early lesions in our cases were in the lower portions, and often on the right side.

Anthraco-Silicosis

An interesting phase of silicosis is found in anthracite coal workers, where the disease is modified by the presence of coal dust. The clinical and roentgenological findings have much in common with ordinary silicosis, yet there is some variation from the complete picture. The association of emphysema with silicosis and the prevalence of barrel-chested workers are not common among the usual silicosis cases.

According to Dreessen and Jones¹¹ anthraco-silicosis (miners' asthma) is an occupational disease characterized by silicotic fibrosis, excessive retention of carbonaceous material, and emphysema. It renders the sufferer susceptible to tuberculosis in later life, as does ordinary silicosis.

These patients have shortness of breath, cough and pains in the chest. Later on in the disease there is weakness, gastric distress, and hemoptysis. There is decreased chest expansion, clubbing of finger nails, prolonged expiration. In more advanced cases, or when infection occurs, there are noted persistent râles, loss of weight, cardiac defects and cyanosis.

Twenty-seven hundred and eleven active workers were studied and practically all the personnel of three representative mines. Six hundred sixteen, or 22.7 per cent,

SCHEME OF X-RAY INTERPRETATIONS (SILICOSIS)

LUNG FIELD APPEARANCE

X-RAY INTERPRETATION

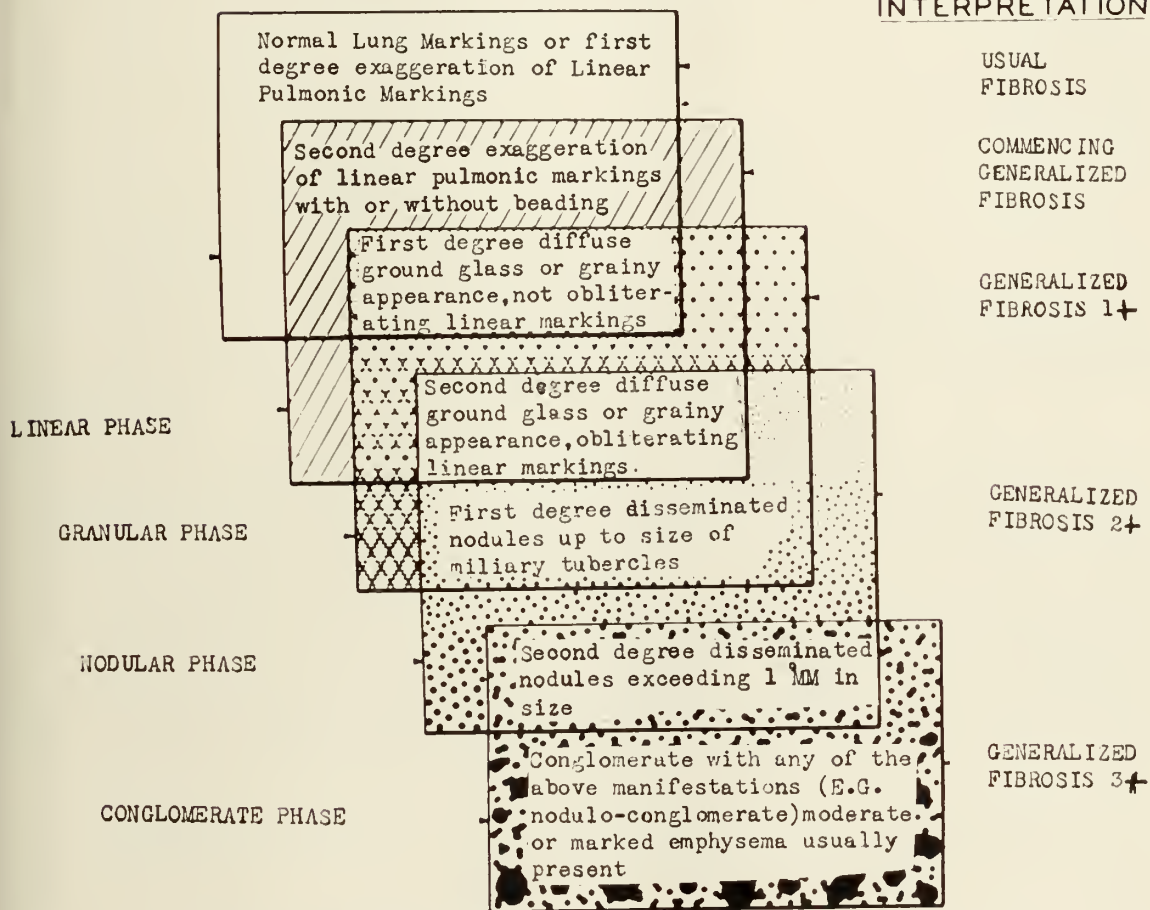


Figure No. 1. Asymmetrical distribution of shadows, unilateral increase of markings, and less discrete or coalescing shadows (mottling), imply complicating pulmonary infection and modify any of the phases illustrated above.

were found to be affected with anthraco-silicosis. Clinical pulmonary tuberculosis was found in 15 per cent of the early cases, and in 43 per cent of the late well-established cases. The incidence of tuberculosis in the controls, and those essentially negative for anthraco-silicosis, was found to be one and two per cent, respectively, which is about the same as would be found in the general population.

It was the opinion of these investigators that tuberculosis complicating anthraco-silicosis was of a milder type than that ordinarily seen in silicosis. I am inclined to agree with them inasmuch as tuberculosis has not been generally associated with anthracosis in the minds of physicians and the public in general. The presence of emphysema, bronchitis and anthracosis makes it more difficult to diagnose tuberculosis than in uncomplicated cases.

Latent Silicosis

One of the unusual characteristics of silicosis as a non-bacterial disease is its progress after cessation of dust exposure. If the disease is well-established, its course and prognosis seem to be altered very little by the removal of the worker to a non-dusty occupation. It is questionable if the cases of early silicosis without infection exhibit this characteristic; however, more data are needed to substantiate this opinion.

In the cases of more advanced silicosis, a change in occupation did not seem to lessen materially the chances of escaping a final tuberculous complication. This was exemplified in the case of granite manufacturers, most of whom had been stone-cutters before starting in business for themselves, and evidently had silicosis. These manufacturers have had only intermittent exposure, and this to the general atmosphere of the plant since they

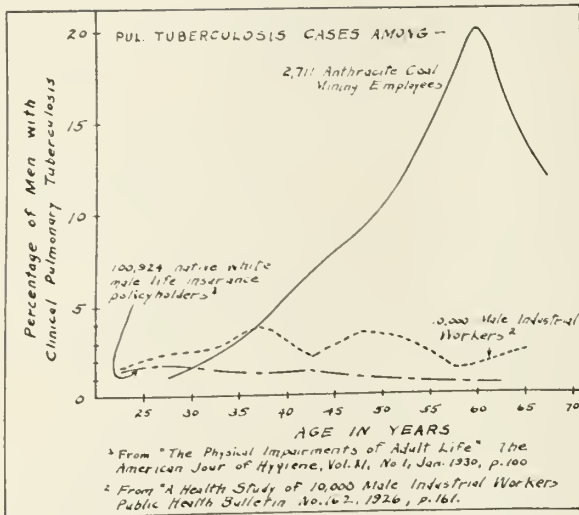


FIG. 2.—PERCENTAGE OF PERSONS HAVING CLINICAL PULMONARY TUBERCULOSIS, BY AGE, IN EACH OF THREE MALE GROUPS.

Figure no. 2.

stopped cutting stone. In most instances, their social and economic conditions were better than that of cutters, which, incidentally, was above the average for industrial workers.

It was possible for us to observe in the granite study 24 cases who had worked in the industry a number of years and then had taken up trades where there was no further dust exposure. The following table summarizes our findings in these cases. The X-rays of most of these workers are shown in U. S. Public Health Service Bulletin 187.

The latency of silicosis has been referred to by other investigators. The South African workers found that "a steady fall over a period of years in dust concentration is not associated with the corresponding fall in the silicosis incidence."¹²

Dr. Pancoast¹³ presents a case of advanced pneumoconiosis in a quartz miner who had been exposed to dust for eight years. He had been out of the mining industry for ten years, yet the X-ray showed extensive pneumoconiosis with irregularities of the diaphragm, and by fluoroscope he found the diaphragm restricted on each side. There was, perhaps, a tuberculous infection intervening at the time.

Britton¹⁴ reports two cases of workers who had been exposed to dust between seven and eight years. They changed occupations and had been away from siliceous dust for eight or nine years. They developed pulmonary symptoms and were found to be suffering from silicosis and tuberculosis. Tattersall¹⁵ also observed cases of latent silicosis in his studies: "Some of the men (rock-drillers), moreover, had changed their occupation for various reasons quite apart from health; but in due course the inevitable dyspnea came on. One man, for instance, worked eight years regularly with rock drills, from 1906 to 1914, then joined the Army, was passed as A-1; but in spite of his open-air life, dyspnea came on in 1918, and from then until his death six years later his illness was a typical case of silicosis."

The Effects of Other Dusts

A summary of the effects of dust other than free silica is given below:

Asbestos: Merewether¹⁶ gives results of a very exhaustive study on the subject of asbestosis. He defines asbestosis as a specific occupational disease of the lungs

TABLE 1.
Summary of cutters, groups A and B, previously exposed to granite dust, but later employed in nondusty trades*

Case No.	Age	Years in Granite	Occupation Since Leaving Granite	Years in Such Occupation	Comment
112	47	26	Salesman	4	Silicosis
299	64	26	Night watchman	13	Silicosis and tuberculosis†
296	46	17	Superintendent	10	Silicosis and tuberculosis†
387	42	14	Secretary of union	4	Silicosis and tuberculosis†
540	51	28	Shipping clerk	6	Silicosis and tuberculosis†
132	52	21	Chauffeur	7	Silicosis and tuberculosis†
289	60	39	City clerk	4	Silicosis and tuberculosis†
440	43	26	Farmer	3	Silicosis and tuberculosis†
579	62	12	Farmer	20+	Silicosis and tuberculosis†
18	50	25	Employed on farm	11	Adv. silicosis and suspected latent tuberculosis
432	54	25	Janitor and fireman	5	Silicosis and tuberculosis†
309	51	28	Janitor	3	Advanced silicosis and tuberculosis†
443	49	23	Street cleaner	6	Silicosis and tuberculosis†
339	55	18†	Employed on farm	15	Silicosis and early tuberculosis
322	45	10	Salesman	10	Silicosis and advanced tuberculosis†
117	54	20	Manufacturer	8	Silicosis and advanced tuberculosis†
58	52	14	Farmer	20	Silicosis and extensive tuberculosis in both lungs†
42	45	27	Insurance agent	4	Silicosis and tuberculosis pneumonia†

† Total years in granite. Returned to industry one year before examination.

‡ Died of silicosis and tuberculosis.

* From P. H. S. Bulletin No. 187.

caused by the inhalation of asbestos dust, and characterized by the progressive development of fibrous tissue. The symptoms are insidious in their onset and irregular in their course. They consist mainly of cough and dyspnea. The roentgenograms show a diffuse ground glass appearance together with a fine pinhead mottling. Death usually results from a low grade bronchopneumonia, but may be due to lobar pneumonia, bronchitis, influenza or less often a sub-acute tuberculous infection. In the lungs of asbestos workers are found asbestos bodies and spicules. From case histories, he found that when the dust is highly concentrated, the minimum period between exposure and production of a serious degree of asbestosis is approximately seven years, although the average interval is about 11 years.

Silicate Dust: Dreessen¹⁷ has made observations on several groups of workers who were exposed to dust containing silicates. These dusts were principally talc and slate. He concludes that: 1. The silicate dusts of tremolite talc and slate induce a fine, diffuse, bilateral fibrosis of the lungs which is definitely demonstrable in the X-ray. 2. While very dusty conditions prevail in certain departments of these two stone trades (tremolite talc and slate) it cannot be said that the resultant pneumoconiosis has led to disability.

Portland Cement: A study of the effect of Portland cement was made by the U. S. Public Health Service a few years ago. It extended over a period of two and one-half years.¹⁸ No disabling pneumoconiosis was found to exist among the workers and no evidence was elicited that exposure to cement dust would reactivate healed lesions of tuberculosis. Miller, Sayers and Yant¹⁹ showed that in 180 days after the injection of cement dust into the peritoneum of guinea pigs, all the dust and a large portion of the pigment had disappeared.

Artificial abrasives: Some of these are silicon carbide (SiC) and aluminum oxide (Al₂O₃). They are products of the electric furnace and are now widely used, principally in grinding wheels, and have largely replaced the use of sandstones in grinding. Artificial abrasive materials are harder than quartz and approach the diamond in hardness. Neither of these materials produced massive fibrosis in animals. Peritoneal injections of carborundum showed that the material apparently is not irritating, and is insoluble, causing no cellular proliferation. The reaction was considered one of inertness.²⁰ It has been stated, however, that silicon carbide did show evidence of activating old tuberculous lesions in animals.

Gypsum: (CaSO₄·2H₂O) is widely used in various parts of the world, principally in making plaster. Riddell²¹ found that gypsum dust did not produce pneumoconiosis or any other harmful effect. Peritoneal injection of this dust showed that it was absorbed without the formation of scar tissue.

Iron dust: Hematite (Fe₂O₃) is the commonest iron ore and is reddish in color. Pneumoconiosis produced by it is commonly called siderosis. It has not been shown that exposure to pure hematite produces a disabling pulmonary fibrosis; however, rock dust encoun-

tered in iron mining may produce a form of silicosis with the usual disability.

Carbon dust is the most common one encountered outside of industry. It occurs in varying quantities in all cities where coal is used as a fuel. It is an important constituent of black smoke from any carbonaceous fuel. The lungs of city dwellers at autopsy invariably show carbon deposits. The exposure in city air is insufficient to cause any harmful effect on the lungs. It has been shown, experimentally, that pure carbon dust from diamonds, the hardest substance known, is harmless.²² Haldane²³ believes that carbon increases the phagocytosis, that it might reduce the potency of quartz and thereby give a simple and effective preventive for silicosis. However, since Haldane set forth this theory, an intensive study has been made of the anthracite coal miners. Dreessen and Jones¹¹ found that the terminal tuberculosis in anthraco-silicosis was of the mild, chronic, proliferative type, in contrast to silicosis where the tuberculosis is of a more virulent nature. Williams²⁴ found a similar characteristic in the old and retired coal miners in South Wales.

Medico-Legal Aspects of Silicosis

The medico-legal situation in recent years regarding silicosis has been tragic and expensive. It reached the point where it was very difficult for a worker with silicosis to get compensation. Silicosis had not been included in the schedules for compensation in most states, and claims went to the open courts. There the merits of the cases were decided by lay juries, most of whom had heard little if anything about the disease, or had never seen an X-ray of the chest. There are several instances where unscrupulous lawyers fomented suits, and many unmerited awards were made by non-medical juries. Some industries were bankrupted, and in most instances the patient had very little left after paying lawyers' and experts fees and the other costs of prosecution. Under many of the better-drawn compensation acts the fees are strictly limited and subject to the scrutiny of the compensation commission.

In some states where silicosis is a compensable disease, the commissioners have recourse to medical boards for evaluation of the claimant's condition and extent of disability, and in this manner the worker and the industry are more likely to obtain equity. It also protects the industry from long and expensive litigation and at the same time assures to the deserving workers who have silicosis an opportunity of obtaining compensation in amounts to commensurate with their condition and disability.

The situation regarding the silicosis problem is different from that relating to other occupational diseases and to accidents. Several factors must be considered in approaching the solution of the silicosis compensation problem. The question of accrued liability is an important factor, as this disease does not develop in a few weeks or months but requires a period of several years. Ordinarily, it does not produce disability until after many years of exposure. The silicotic who has to change occupations is confronted with the problem of re-employ-

TABLE 2.
Tentative Thresholds of Dust Tolerance

Industry	Average Dustiness, Millions Particles per Cubic Foot	Amount of Free Silica	Tentative Threshold, Millions Particles per Cubic Foot	Hazards— Actual and Potential
GRANITE				
Cutters	47.5	30.35	Less than 10	Silicosis
General atmosphere	20	30.35	Less than 10	Silicosis (mod. fibrosis)
Less than general atmosphere	9	30.35	Less than 10	Slight fibrosis (no disability)
ANTHRACITE COAL				
Rock drillers	241	31	Less than 5	Anthraco-silicosis
Miners and helpers	480	1.5	Less than 50	Anthraco-silicosis
Transportation	7-253	13	Less than 15	Anthraco-silicosis
BITUMINOUS COAL				
Rock drillers	78	54	Less than 5	Silicosis
Cement	26	6.8 (raw)	Less than 15	Silicosis?
Slate	15-715	Slt. trace to 3	Less than 15	Pulmonary fibrosis
Talc	50-1440	?	Less than 15	Pulmonary fibrosis
Asbestos	43	?	Less than 15-20	Asbestosis
Marble		1	Over 30	No disability
Cotton Cloth Mfg.	7	?		No disability
Silverware Polishing	5	1.7		No disability
Municipal	4	?		No disability

ment, as his condition which will be diagnosed on pre-employment examination excludes him from a job in many instances. On the other hand, the employer is assuming an accrued liability if he employs a silicotic. The worker can obtain compensation if it is shown that his condition has been aggravated. This is a difficult situation and one that needs serious consideration. A plan should be worked out whereby the employer would assume only the portion of liability that accrued in his plant. Under such a system, the worker could obtain employment and earn a living wage.

The question of tuberculosis necessitates additional consideration. Under the present system, if tuberculosis develops as a complication of silicosis, the industry is held responsible. When clinical (or active) tuberculosis is present, disability is also present, varying in extent with the amount of toxemia present. The prognosis is not good, and the worker should be removed from employment and given compensation. As a matter of fact, less than one in every 1,000 persons in the general population will develop tuberculosis, irrespective of industrial environmental conditions. The rate among industrial workers, where a silica hazard exists, is from two to five times as high as in the general population. Seventy-five per cent of those who have silicosis die of tuberculosis as a complication. If we can prevent silicosis, we can reduce the general tuberculosis rate. If no steps are taken to prevent silicosis, the tuberculosis rate will increase not only in industry, but also at home, because of contacts. The extra cost of such tuberculosis will be greater than the amount the public would contribute toward a fund taking care of accrued liability. This seems a logical way to take care of a difficult situation.

The extent of disability from silicosis cannot be estimated accurately from the X-ray alone, and should not be attempted. The patient's general condition must

be taken into consideration. Employers should provide safe atmosphere and employees be allowed to continue work as long as they are able to do so without further harm to themselves. Experience in some foreign countries has shown that it is a great mistake to remove silicotics from work too early. The amount of compensation received is less than that of their wages, and they must necessarily lower their standards of living. If they seek other employment, they are again handicapped because of their disability and employers are loath to employ them. Persons with silicosis find it hard to adapt themselves to work and routine to which they are unaccustomed. In many places where silicosis is endemic, there is generally a scarcity of jobs where these unfortunates can be placed. Adequate compensation seems to be very necessary.

Prevention

Sanitary engineering in the field of industrial hygiene is a new profession, as is this kind of medical specialization. The sanitary engineer is the closest ally of the industrial physician, and an absolute necessity in determining the working conditions in plants. Establishing of control measures is largely his duty, as well as maintenance of safe working conditions after preventive equipment has been installed.

In a program of dust control, the extent of existing hazards as well as the thresholds of danger must be known, in so far as possible. The limits of tolerance have been set, tentatively, for several occupations. Some of these are given in the following table:

The Public Health Service, in its various studies of workers in dusty trades, did not find significant pulmonary fibrosis in any trade where the dust exposure was less than five million particles per cubic foot of air.

Bloomfield²⁵ has recommended four general methods of dust control: 1. Substitution of non-dust producing

DUST PROBLEM IN GRANITE CUTTING CAN BE CONTROLLED BY THE USE OF EFFICIENT LOCAL EXHAUST SYSTEM

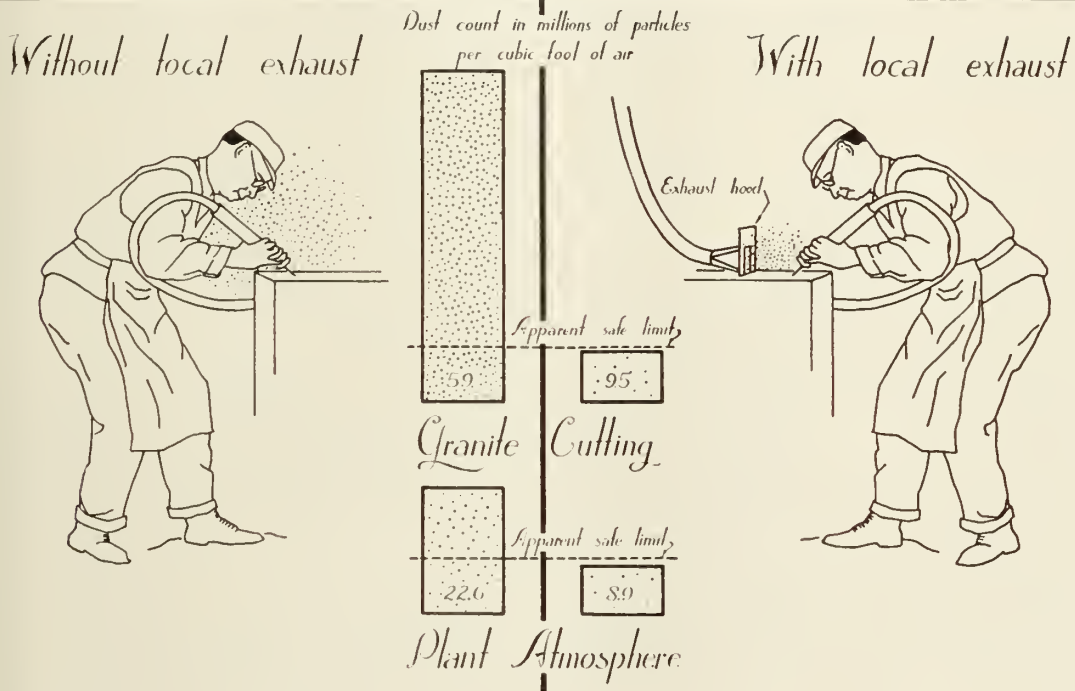


Figure No. 4.

processes, or the use of harmless substances. This procedure, however, has a rather limited application. One example of substitution is the use of non-silica parting compounds in making foundry moulds. It is obvious that the use of a harmless parting compound instead of one containing free silica will lessen the hazard to a considerable extent. 2. The second method consists in isolating the dusty process. This method has many possibilities, but unfortunately is not widely used. With this procedure, the dust-generating process is confined to a single closed space, and only the workers actually engaged in the operation are exposed to dust. 3. The third method, and perhaps the best known, is the practice of wetting the dust at its source. It was shown that by wet methods the dust in drilling was reduced from 568 to 33 million particles per cubic foot; and in loading, from 636 to 32. Even though these concentrations are above the threshold of tolerance, the great reduction in dustiness is worth while. 4. The fourth method is exhaust ventilation, and is perhaps the most effective. Fortunately, it has the widest application of all the methods. Exhaust equipment must be designed for each particular problem, and when adequate equipment is obtained, its efficiency is then dependent on its proper maintenance. The following graph shows the effectiveness of exhaust ventilation applied to stone cutting.

Personal protective measures in the form of masks and positive pressure air helmets are valuable. There are several masks of the approved type on the market. Equipment of this kind must be selected for the specific problem at hand, inasmuch as these masks are not designed to protect against all of the dusts. They require constant care and upkeep, and are often misused. In the case of caustic dust, the mask presents a problem as moisture precipitates dust on the face and produces skin burns.

The positive-pressure helmet is suitable only for certain specific uses. It cannot be used by persons engaged in an occupation that requires them to move about the plant. This type of protection from dust is a palliative measure only, and should never be used as a substitute for adequate ventilation either local or general.

The selection of employees for dusty trades is most important; persons who have had prolonged exposure to tuberculosis should not be placed in an occupation where they will be exposed to siliceous dust. Likewise, persons who have a history of excessive respiratory disturbances should be excluded. Those who are below normal in general physique are not suitable for employment in dusty trades. Those selected should have physical examinations at stated intervals or at any time respiratory disturbance occurs.

It is very important that workers exposed to dust be educated regarding the hazards to which they are subjected. They must know that they share the responsibility of protection with their employer. It is their primary duty to help keep the ventilation equipment in proper functioning condition, and the masks and helmets clean and in order.

Morbidity

Respiratory diseases stand out as the most prominent thing in the morbidity of workers in dusty trades.

The general manufacturing group may be taken as an average. It is apparent that granite cutters, anthracite coal miners, cement workers, and a group of gold miners have much higher rates of influenza and gripe than the average.

Mortality

A study of the mortality trend in the United States reveals that tuberculosis has declined in a most gratifying way, from approximately 200 per 100,000 in 1900, to 59.5 in 1933. During this period there has been an increase in certain occupations associated with dust exposure. It has been shown that by sanitary engineering methods, this industry can be made safe from dust exposure.

The influence of dust on mortality from tuberculosis is clearly indicated in the following table. New methods of manufacturing stone, which created excessive dust by the use of pneumatic tools, were introduced in the granite industry about the beginning of the present century, and the tuberculosis rate has increased rapidly with their use. The rate has risen in direct proportion to the length of time during which they have been employed as follows:

1.5 per 1,000	1890-1894
10.8 per 1,000	1910-1914
19.5 per 1,000	1924-1926*

(* During period of our observations)

A consideration of the mortality statistics of Barre, Vermont, shows that there has been an excessive death rate from pneumonia and other respiratory diseases (tuberculosis excluded) during this period.

Public Health Aspects

There are about 15 million workers in manufacturing, mechanical and mineral industries in the United States. The control of occupational diseases in this group is quite a public health problem and can be met. Medicine and public health, broadly speaking, are greatly advanced in scientific knowledge and skill. There are many men of ability in the profession; nevertheless, they are backward in the application of this knowledge and skill to the problems of today. We know of methods of control, and even of elimination, of many contagious as well as occupational diseases. Yet they continue to occur. Mr. Hastings²⁶ has asked, "Why do we spend \$15,728,925,396 annually for treatment and care of the sick, and lost wages, and spend less than one-half of one per cent of this amount for prevention?" New York State spent \$531,808 for compensation in 1934. The per worker cost for industrial hygiene during the fiscal year 1936-1937, which is allotted for 21 states hav-

ing over 19,000,000 employees, is \$0.015. This is a very small amount for the many industrial health problems that exist, but will yield a return much greater in proportion than the amount spent.

The states can, and will, greatly aid in further reduction of the incidence of tuberculosis with their programs of industrial hygiene, which, incidentally, is a good example of how knowledge can be applied in the control of disease.

In the past, only a few states had taken steps to assist industry to control its hazards. At present, there are 21 industrial hygiene units in states, most of which were established since the passage of the Social Security Act, which provided funds for such work. Plans are under way to establish several more, which will include more than one-half of the states and approximately 84 per cent of the industrial population²⁷. We have good reason to expect a marked reduction in the incidence of tuberculosis in industry through the control of harmful industrial dusts.

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The JOURNAL LANCET

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South Dakota State Medical Association
Montana State Medical Association

The Minnesota Academy of Medicine
The Sioux Valley Medical Association

Great Northern Railway Surgeons' Assn.
American Student Health Association
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MINNEAPOLIS, MINN., JUNE, 1937

MONTANA MEETING

The Medical Association of the State of Montana meets at Great Falls this year, July 11-14. This is the vacation month of the year. Successful men are disinclined to take out-and-out vacations; they like to combine them with some useful purpose; and those who go to the trouble of arranging programs wisely have this in mind. July in Montana is perfect, and the attendance should be good.

There will be a certain note of sadness at this gathering because of the absence of Dr. E. G. Balsam, who served as secretary for so many years, and who died of embolism of the right lung in Billings on May 13, 1937, at the comparatively early age of 53 years. He did much unselfish work for the profession of Montana and will certainly be missed.

A. E. H.

IT IS LATER THAN YOU THINK

A preceptor of blessed memory used to say, "Dispose of matters as they come up, it saves time and thought." He had this sentence pasted before him on his desk as a constant reminder. An old adage has it, "Don't put off until tomorrow that which you can do today." And now comes a Chinese expression, "It is later than you think," and while it does not quite paraphrase the for-

mer two, it nevertheless emphasizes with a peculiarly oriental slant the importance of promptness and punctuality.

The physician must be alert, "on his toes," ahead of time if anything. To arrive, even a few minutes after the baby has been born, is a sad disappointment to all concerned. In case of a consultation it is considered inexcusable for one doctor to keep another waiting. But why in heaven's name he should be such an infernal procrastinator in so many other matters we cannot understand. Oh yes, it is a very human trait, very human indeed. And then of course the physician has been peculiarly inhibited in so many ways. He never knows until the very last minute whether he can go on a cherished fishing or convention trip; and so through years of disappointments of various kinds he becomes accustomed to the futility of planning and neglects certain matters of vital interest to himself and his family, always thinking of others. He does not make his Pullman and hotel reservations until the very last minute when he is going on a trip. He fails to review the provisions of his life insurance policies so that alterations may be made to fit changed needs. And often he dies intestate. It might be well to have the admonition in mind that *it is later than you think*.

A. E. H.

A STEP FORWARD

South Dakota at last has secured legislation needed to enforce the testing of all her cattle for tuberculosis. It is expected that the work of eradicating this disease from our herds will now proceed and that the state will soon be listed as an accredited area. I am informed that this will leave California as the only state not accredited. This action of our legislature marks another step in the fight against tuberculosis.

The medical profession individually and through the state medical society has warmly supported this legislation. Their endorsement and the education of the general public have no doubt been helpful in securing its passage. I suspect, however, that economic pressure was the effective driving force. The desire to retain federal financial assistance which was to be withdrawn July 1st, and the fear of further discrimination against South Dakota cattle and dairy products, did the trick. One wonders whether the fight against human tuberculosis will not proceed along similar lines. Education of the public about tuberculosis and professional support may help but when the time comes that the average citizen and tax payer finds that it is cheaper to prevent tuberculosis than to care for its victims, then and perhaps not until then, will come a demand for a more efficient and active program than public opinion will support at this time.

A. S. R.



ELMER G. BALSAM, M.D.

CAT.

ELMER G. BALSAM, M.D.

1884-1937

Dr. Elmer G. Balsam, for twenty-one years secretary of the Medical Association of Montana, died May 13th in Billings from a pulmonary embolism, following a thrombo-phlebitis of his left leg.

Dr. Balsam was born in Manistee, Michigan, June 17th, 1884. He was graduated from the University of Michigan School of Medicine in 1906. After serving an internship in the Northern Pacific Beneficial Association Hospital in Brainerd, Minnesota, he went to Billings to practice, and remained there throughout his life. A general practitioner, he took great pride in being a family doctor and often said he would not care to change his allotted position in the medical field. He had a large following of loyal patients.

Dr. Balsam was always interested in medical economics. In this phase of his life work he made many friends and was one of the best known doctors in the Northwest.

During the World War Dr. Balsam served as medical aide to Governor Sam Stewart. He was also president of the Montana Medical Examining Board. At the time of his death, he was president of the Montana State Board of Health. He was particularly interested in preventive medicine, and he was ever on the alert to

harmonize conflicting interests of individualistic practice and Board of Health work.

The doctor leaves a family of wife and three boys who are still of school age. He was well liked by his confreres in the Medical Association of Montana and his useful life will be long remembered by them.

J. A. E.

CAT.

ELIAS P. LYON

1867-1937

With the passing of Dean Lyon so soon after his retirement, we recall the opening sentence of his response at the testimonial dinner given at the Minnesota Union June 10, 1936. "Ave, Mr. Toastmaster, President Coffman, Ladies and Gentlemen, Ave, and shall we add *morituri Salutemus?*" There was something dramatic and portentous about this utterance, even though he hastened to reverse the gladiator's salutations to connote, so far as he was concerned, "We who are about to live, salute you." He added that he ought to have a good time from then on looking at the show, and slyly criticizing the performers.

Who does not envy the man who can so time his strokes, his down-sittings and uprisings, and actually deliver his own obituary to assembled friends and co-workers while still in possession of faculties with which to do so in a brilliant and an impressive manner?

At another point he said, "I prefer the sententious truth of Maeterlinck, 'There are no dead.'" This had the ring of Osler's *confessio fidei* in *Science and Immor-*

talities, "I trust you will come to the opinion of Cicero, who had rather be mistaken with Plato than be in the right with those who deny altogether the life after death."

He may have had the influence of his teaching in mind, and how that would live on after him, because he took the profession of teaching seriously. He passed out from time to time typewritten copies of "Why I Teach," by Louis Burton Woodard, the last verse of which read:

Because I know that when life's end I reach
And thence pass through the gates so wide and deep
To what I do not know, save what men TEACH
That the remembrance of me men will keep
Is what I've done; and what I have is naught,
I teach. A. E. H.

LEE BEY GREENE 1881-1937

Dr. Lee B. Greene was born at Valparaiso, Ind., April 4th, 1881, and passed away at a St. Paul hospital on May 3, 1937. His parents, Mr. and Mrs. James L. Greene, homesteaded near Sheldon, N. Dak., in 1882. Dr. Greene attended the school at Sheldon, then entered the North Dakota Agricultural College, receiving his bachelor of science degree in 1901. He was graduated from the University of Michigan Medical School in 1905, and took his internship at the Northern Pacific Hospital, Brainerd, Minn. He began his practice at Monango, N. Dak., in 1906, remaining there eight years; then moving to Edgeley, N. Dak.

In July, 1917, he enlisted in the medical corps, and was commissioned first lieutenant at Camp Cody; was sent overseas to become surgeon in the first division with the rank of captain, serving throughout the Argonne offensive in that capacity.

He was discharged in April, 1919, and resumed his practice at Edgeley. At the time of his death he held the rank of major, in command of the medical detachment of the 164th Infantry, North Dakota National Guard.

Besides the American Legion, which he served in high departmental offices, he belonged to the Masonic Order, to El Zagal Shrine, and the Lions Club.

Dr. Greene took an active interest in organized medicine and was a charter member of the Southern District Medical Society. He was for years a member of the Council of the State Medical Association and at the time of his death first vice-president of the State Association.

Dr. Greene was a man of versatile action. He took an active part in community affairs. Few knew his many acts of kindness, of the time and substance given to the needy; but this was his daily service.

Dr. Greene is survived by his wife and two daughters, Mrs. R. H. Wenzel of St. Paul, and Anne, of Edgeley, and a brother, Dr. Paul Greene, of Livingston, Mont. He was buried at Sheldon. Full military honors were accorded him.

F. W. F.

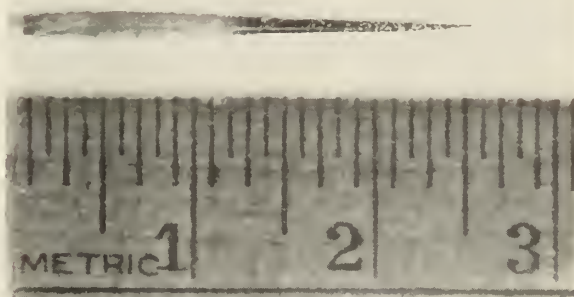
CASE REPORT

PERFORATIONS OF THE INTESTINE FROM AN UNUSUAL FOREIGN BODY

J. H. GARBERSON, M.D., F.A.C.S.
Miles City, Montana

Perforations of the intestine from swallowed foreign bodies are rare considering the number of such bodies ingested, especially in childhood. The uniqueness of the causative agent in this instance, together with the unexpectedness of its discovery, makes the following case worthy of report.

History: S. E. Male. Admitted August 3, 1935. Age 23. Ranch hand. Family history negative. His own history negative except for some attacks of abdominal trouble during the past 18 months, when he had some distress in the right lower abdomen and nausea. These, three in number, had always been transient. History of the present attack is that during the early morning, on the day of admission, he had a sudden, severe, cramping pain in the abdomen, associated with nausea but not vomiting. Bowels had not moved since onset. There were no genito-urinary complaints. During the day, he had been seen by Doctor Alexander of Forsyth, Montana, who referred the case to us. His temperature was 100°F. Pulse 98. Respirations 22. He seemed ill and in considerable pain. White blood count 15,750. Urinalysis essentially negative except for a few pus cells. The general examination was essentially negative. The abdomen was moderately rigid throughout. There was definite rebound tenderness, and his pain and tenderness seemed to be definitely localized in the right lower quadrant. On account of history of previous attacks, which had apparently centered in the right lower quadrant, his leukocyte count, and moderate temperature, a tentative diagnosis of acute appendicitis, possibly perforated, was made and operation was advised and accepted.



This porcupine quill, 2.6 centimeters long and 2 millimeters at the thickest portion, was found free in the peritoneal cavity. It had passed through the stomach and transversed the duodenum before perforating the bowel.

Operative Record: Under ethylene anesthesia, supplemented by small amounts of ether, an outer right rectus incision was made. A small amount of purulent fluid was found free in the peritoneal cavity. The terminal third of the appendix was definitely reddened and swollen; but there was no evidence of perforation and it was felt that it was probably not the cause of his symptoms, and of the purulent fluid within the abdomen. However, it was removed because his history was indicative of previous attacks. The abdominal incision was enlarged upward and duodenum and pyloric regions were explored for possible perforated ulcer. There was no evidence of any ulcer, but in the upper abdomen was found more purulent fluid which had a definite bile-stained appearance. The gall bladder and ducts were explored and found negative. The small bowel was examined inch by inch and about two feet below the ligament of Treitz, on the anti-mesenteric portion of the bowel was an area which was thickened, reddened, and, in

the center, covered with a diphtheritic type of exudate. Gentle probing of this area disclosed a minute perforation. The perforation was closed with sutures of catgut, and the peritoneal cavity was carefully sponged out and dried. During this process, a small, yellowish black needle-like object was found free in the peritoneal cavity. On examination this proved to be a porcupine quill. It was 2.6 cms. in length and 2 mms. at its thickest portion. The abdomen was closed without drainage.

Postoperative Notes: Postoperative course was uneventful, with the exception of one slight attack of epigastric pain on the tenth postoperative day, which lasted only a few hours.

On questioning the young man and his father, it was learned that some two or three days previous to his admission, one of the ranch dogs had returned with his face literally studded with porcupine quills. The dog's head had been held between the spokes of a wagon wheel and with pliers, the quills had been drawn from his face and nose. Although the patient did not know how he could possibly have swallowed one of the quills, he must have, in some manner, ingested it with food or water. It had passed through the stomach and only after transverse the duodenum and about two feet of the small bowel had its point lodged, after which, owing to the barbed-like construction of the porcupine quill, perforation was inevitable.

SOCIETIES

TENTATIVE PROGRAM THE MONTANA STATE MEDICAL ASSOCIATION

Annual Meeting, Great Falls, July 13-14
To Be Held in Heisey Memorial
Headquarters: The Rainbow Hotel

On the afternoon of July 13th, 1937, the following papers will be given:

- (1) Presidential Address—Dr. John A. Evert, Glendive, Mont.
- (2) "Treatment of Uterine Myomas," by Dr. Henry Schmitz, Chicago, Illinois.
- (3) "Conservative Renal Surgery," by Dr. Roland G. Scherer, Bozeman, Mont.
- (4) "Fractures of the Os Calcis," by Dr. R. B. Richardson, Great Falls Clinic, Great Falls, Mont.

On the evening of July 13th—Meeting of Council and House of Delegates and a smoker for the men.

On July 14th, 1937, opening at 9:00 A. M. and extending through the day, the following papers will be given:

- (1) "Fluid Intake in Edematous Patients," by Dr. F. R. Schemm, Great Falls Clinic, Great Falls, Mont.
- (2) "Paralysis of the Peripheral Nerves of the Upper Extremity," by Dr. J. K. Colman, Murray Hospital Clinic, Butte, Mont.
- (3) "Massive Purulent Pericarditis," by Dr. Fred F. Attix, Lewistown, Mont.
- (4) "Heart Disease in Middle Life," by Dr. J. H. J. Upham, President American Medical Assn., Columbus, Ohio.
- (5) "Cancer and Its Treatment With Radium," by Dr. H. H. James, F. A. C. S., Murray Hospital Clinic, Butte, Mont.
- (6) "Psychosis Associated With the Involutional Period," by Dr. Ernest M. Hammes, Professor

Nervous and Mental Diseases, University of Minnesota, St. Paul, Minnesota.

- (7) "Nephritis in Children," by Dr. Jessie M. Bierman, Helena, Montana.

At 7:30 P. M. July 14th, Annual Banquet of the Montana State Medical Association with address on "Changing Times in Medicine," by Dr. J. H. Upham, President of the American Medical Association of Columbus, Ohio.

MINNESOTA STATE MEDICAL ASSOCIATION Annual Meeting, St. Paul, Minnesota May 2, 3, 4, 5, 1937

The 84th annual session of the Minnesota State Medical Association was unusually successful, both in the attendance and in the nation-wide attention which its scientific program attracted.

On Sunday, May 2, the Council met at 9:00 A. M. in the Lowry Hotel. At 3:00 P. M., the House of Delegates met in the ballroom, and at 4:30 P. M. on Sunday the reference committees met for business. At 5:00 P. M. on Sunday the Council met once more, followed at 7:30 P. M. by the House of Delegates. Dr. E. H. Skinner, Kansas City, Mo., spoke on "How the Kansas City Profession is Meeting Social Security Problems." Dr. Olin West, Chicago, secretary of the American Medical Association, spoke on "Better Health" activities.

The Council also met on Monday and Tuesday mornings. With President A. W. Adson, Rochester, presiding, the general membership heard Dr. E. H. Skinner, president of the American Radium Society, deliver the Russell D. Carman Memorial Lecture on "Reflections Upon the Roentgenology of Fractures" Monday at 11:00 A. M., followed by "The Irradiation Therapy of Tumors With a Consideration of the Possibility of Super-Voltage X-Rays," by Dr. Robert Stone, of San Francisco. On Monday came the famous Congress on Allied Professions, where Rev. Alphonse M. Schwitalla, S. J., St. Louis, president of the Catholic Hospital Association, was to have spoken. Others were: Dr. Martha Eliot, Washington, D. C.; C. Rufus Rorem, Ph.D., of the American Hospital Association; and Dr. Morris Fishbein, editor of *The Journal of the American Medical Association*. Dr. Fishbein, however, was not in attendance.

On Tuesday, May 4, the general assembly heard Dr. John M. Wheeler, Columbia University, speak on "Important Injuries About the Eyes"; and Dr. Francis D. Murphy, Milwaukee, talk on "Hypertensive Heart Disease."

On Tuesday afternoon at 1:30 there was a general discussion on medical problems by Dr. Maxwell J. Lick, president of the Medical Society of the State of Pennsylvania; Dr. Nathan B. Van Erten, speaker of the House of Delegates of the American Medical Association. That evening there was an Industrial Dinner at the Hotel Lowry, and a public health meeting in the St. Paul Auditorium.

On Wednesday morning, May 5, the Northwest Industrial Medical Conference opened at 8:00 A. M. Dr. J. R. Kuth, Duluth, Dr. W. McK. Craig, Rochester, Dr. H. W. Meyerding, Rochester, Dr. Maxwell J. Lick, Erie, Pennsylvania, and Dr. Wallace Cole, St. Paul, were speakers.

At 10:00 A. M. came the secretary's report and the installation of officers. At 3:00 P. M. on Wednesday the meeting was ended by a panel on industrial medicine headed by Dr. A. W. Adson, Rochester.

Dr. James M. Hayes, Minneapolis, is the new president of the Minnesota State Medical Association, and will take office on January 1, 1938. Dr. W. R. McCarthy, St. Paul, is 1st vice-president; Dr. B. A. Smith, Crosby, is 2nd vice-president; Dr. E. A. Meyerding, St. Paul, is the re-elected secretary; and Dr. W. H. Condit, St. Paul, is the treasurer. Dr. W. W. Will, Bertha, is speaker of the House of Delegates; Dr. Joel C. Hulikrans, St. Paul, is vice speaker; Dr. Chester A. Stew-

art, Minneapolis; Dr. B. J. Branton, Willmar; Dr. George Earl, St. Paul; and Dr. Edwin J. Simons, Swanville; are councillors. Dr. J. T. Christison, St. Paul, is the association's delegate to the American Medical Association's meeting in Atlantic City, and Dr. Meyerding is his alternate.

Mrs. W. B. Roberts, Minneapolis, is the new president of the Minnesota State Medical Association's Woman's Auxiliary for 1937-1938. Mrs. John Dordal, Sacred Heart, is a vice-president; Mrs. G. E. Hertel, Austin, is auditor; and Mrs. R. J. Josewski, Stillwater, is treasurer.

MINNESOTA RADIOLOGICAL SOCIETY

Annual Meeting St. Paul, Minnesota

The annual meeting of the Minnesota Radiological Society was held in St. Paul, Minnesota, in connection with the meeting of the Minnesota State Medical Association. The annual Carman Lecture was delivered to the general assembly of the Minnesota State Medical Association by Dr. Edward H. Skinner, of Kansas City, on "Reflections on the Roentgenology of Fractures."

Dr. Skinner also addressed the Minnesota Radiological Society on the subject "Comments upon Early Books upon Electricity and the Roentgen Ray."

Dr. Robert S. Stone of San Francisco delivered the annual Christian Lecture on Cancer before the State Medical Society. His subject was "Irradiation Therapy of Tumors with a Consideration of the Possibilities of Supervoltage X-rays." He also addressed the Minnesota Radiological Society on "The Professional and Economic Status of the Radiologist."

Officers for the coming year were elected as follows: president, Dr. Walter H. Ude, Minneapolis; vice-president, Dr. Leo G. Rigler, Minneapolis; secretary-treasurer, Dr. Harry Weber, Rochester.

LEO G. RIGLER, M.D.
Secretary-Treasurer.

NORTH DAKOTA STATE MEDICAL ASSOCIATION

Annual Meeting, Grand Forks May 16, 17 and 18, 1937

The 50th annual meeting of the North Dakota State Medical Association opened at Grand Forks on Sunday, May 16; and most of the morning was devoted to registration. The afternoon was devoted to scientific exhibits and lectures; but the same day, Dr. H. P. Rosenberger, Bismarck, was elected president of the North Dakota Academy of Ophthalmology and Otolaryngology. Dr. Nelson A. Youngs, Grand Forks, became vice-president; Dr. F. L. Wicks, Valley City, was chosen secretary; and Dr. A. D. McCannel, Minot; Dr. Axel Oftedal, Fargo; and Dr. J. P. Miller, Grand Forks, were elected counsellors.

Tuesday morning opened with a scientific session in the high school auditorium at 9:00 A. M. At noon, the North Dakota Health Officers' Association met, with Dr. Leonard W. Larson, Bismarck, presiding. Dr. George U. Ivers, Fargo, was elected president of this group; Dr. W. A. Wright, Williston, was chosen vice-president; Dr. Maysil I. Williams, Bismarck, was elected secretary.

On Tuesday, the North Dakota State Medical Association elected Dr. William H. Long, of Fargo, to the presidency. Dr. Long will succeed Dr. Edwin Lincoln Goss, who became president at this convention. The new 1st vice-president is Dr. H. A. Brandes, Bismarck. Dr. A. W. Skelsey, Fargo, was renamed secretary; and Dr. W. W. Wood, Jamestown, was chosen treasurer again. Dr. Aloysius Patrick Nachtwey, Dickinson, is delegate to the American Medical Association meeting at Atlantic City; and Dr. Clyde Ernest Stackhouse, Bismarck, is his alternate.

Dr. William Crozier Fawcett, Starkweather; Dr. William Albert Gerrish, Jamestown; and Dr. Jesse William Bowen, Dickinson, were recommended to the State Board of Medical

Examiners. Dr. Fawcett also was elected delegate to the American Medical Association's meeting in behalf of the University of North Dakota Medical School.

New counsellors are: Dr. George Francis Drew, Devil's Lake; Dr. Phillip G. Arzt, Jamestown; Dr. Frederick William Fergusson, Kulm; and Dr. Albert Edgar Spear, Dickinson.

Of especial interest to physicians attending this 50th anniversary of the 1st year of the association, was the Golden Jubilee service held at 11:30 A. M. on Monday, May 17, with Dr. James Grassick presiding. Dr. Grassick read his paper, "Fifty Years Ago"; and introduced the five living physicians who held licenses in North Dakota's territorial days. These are: Dr. Henry O'Keefe, Grand Forks; Dr. Charles McLachlan, San Haven; Dr. George W. Glaspel, Grafton; Dr. James Prentiss Aylen, Grafton; and Dr. James Grassick, Grand Forks.

Mrs. A. W. Ide, St. Paul, Minnesota, presented a report of the first year of the North Dakota State Medical Association, written by her father, the late Dr. J. G. Millspaugh (see THE JOURNAL-LANCET, February 1, 1936, p. 65). Mrs. E. C. Haggensen spoke briefly on the trials of a pioneer physician's wife.

The North Dakota Academy of Ophthalmology and Otolaryngology held its nineteenth annual session at Grand Forks May 17th, under the presidency of Dr. J. P. Miller. Dr. Arthur E. Smith of Los Angeles presented an illustrated address on "Reconstructive and Plastic Oral Surgery." Officers elected included: Dr. H. Rosenberger, Bismarck, president; Dr. N. A. Youngs, Grand Forks, vice-president; Dr. F. L. Wicks, Valley City, secretary-treasurer. Counsellors: Dr. A. D. McCannel, Minot; Dr. J. P. Miller, Grand Forks; Dr. Axel Oftedal, Fargo.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Annual Meeting, Rapid City, S. D., May 24, 25 and 26, 1937

South Dakota physicians gathered at Rapid City for the 56th annual meeting of the association; and about 35 members of the Woman's Auxiliary were in attendance concomitantly. The House of Delegates convened on Monday evening, May 24, to elect a committee on nominations, and to consider other business.

On Tuesday morning, May 25, Dr. Albert M. Snell, Rochester, Minnesota, associate professor of medicine in the University of Minnesota Graduate School of Medicine, was on the program. Dr. Myron O. Henry, Minneapolis, instructor in orthopedic surgery in the University of Minnesota, held a fracture clinic; and Dr. Claude F. Dixon, Rochester, Minnesota, associate professor of surgery in the Minnesota graduate school, spoke. Dr. George Edwin Robertson, Omaha, Nebraska, instructor in pediatrics in the University of Nebraska College of Medicine, was also a speaker.

Tuesday afternoon the same speakers took part in a general scientific session, with the addition of Dr. Harry M. Weber, Rochester, Minnesota, instructor in radiology in the University of Minnesota Graduate School of Medicine.

The joint banquet was held Tuesday evening, with Governor and Mrs. Leslie Jensen, Mrs. N. J. Nessa, Sioux Falls, and Dr. R. J. Jackson, of Rapid City, as special guests. Dr. J. L. Stewart, Nemo, president of the association, delivered an address; as did Dr. E. A. Pittenger, Aberdeen, the president-elect. Dr. R. G. Leland, Chicago, director of the bureau of economics of the American Medical Association, was a banquet speaker. Dr. Paul P. Ewald, president of the Black Hills Medical Society, was toastmaster.

Dr. E. A. Pittenger, chosen president last year, was inaugurated into office. Dr. J. F. D. Cook, Langford, the retiring secretary-treasurer, was elected president for 1938-1939, to take office at the 1938 convention. Dr. B. A. Dyar, Pierre, becomes the executive secretary; and Dr. C. E. Sherwood, Madison, is the secretary-treasurer. Dr. D. S. Baughman, Madison, will succeed Dr. Sherwood as councillor from the Madison district.

Dr. J. L. Stewart, Nemo, was elected councillor-at-large, and the present councillors from the Black Hills, Rosebud, Kingsbury, and Whetstone districts were re-elected.

On Wednesday morning, the physicians went on a tour of the Black Hills, and visited the state tuberculosis sanatorium at Sanator in the afternoon, where Dr. Vincent Sherwood, superintendent, was host. Papers were read by Dr. Thomas J. Kinsella, Minneapolis, of Glen Lake Sanatorium, Oak Terrace, Minnesota; and Dr. Sherwood. Dr. Harry M. Weber, Rochester, Minnesota, conducted a clinic.

Huron, South Dakota, is the meeting-place of the association for 1938.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE Meeting of February 10, 1937

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, February 10, 1937. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. E. M. Jones.

There were 42 members present.

Dr. S. Marx White read the following memorial of the Necrology Committee:

RICHARD OLDING BEARD was born December 20, 1856, at Tollington Park, Middlesex, England, the son of Richard and Anne Beard. His father was a manufacturer. He was educated at Camden House Academy, Brighton, England, and came to the United States in 1869, settling first in Chicago. He was engaged as book buyer and stock clerk for two large book concerns for a period of about eight years. Graduated from the Department of Medicine of the Northwestern University in 1882, he came at once to Minneapolis, Minnesota, where he engaged in the active practice of medicine. He was Assistant Commissioner of Health from 1886 to 1889.

He was one of the founders of the Medical School of the University of Minnesota in 1888 and took an active part with Dean Frank Fairchild Westbrook in the movement which resulted in the unification of medical teaching in this state at the University of Minnesota in 1908. He was Secretary of the Faculty of the Medical School from 1888 to 1903 and from 1906 to 1925, and was Head of the Department of Physiology from 1888 to 1912. Holding the Professorship of Physiology in the Medical School from 1888 to 1925, he retired from active teaching in the latter year, becoming Professor Emeritus. He founded the School of Nursing at the University of Minnesota in 1909. This was the first true University Nursing School. He was active in the organization of the Central School of Nursing at the University of Minnesota in 1921, uniting the nursing services of four major hospitals with the school. He also initiated movements to establish endowment funds for the Nursing and Medical Schools of the University.

Upon retirement from active duty in the University, he was engaged in the direction of public health work, serving as Executive Secretary of the Health Council of the City of Minneapolis and the County of Hennepin from 1925 to 1932. During a part of this time, also, he was active as chairman of a voluntary committee for the promotion of legislation to establish a psychopathic hospital at the Medical School. Upon retirement in 1932 from public health work, he devoted himself to writing. His death cut short a monumental task to which he had laid his hands, that of writing a history of the Mayo Clinic. During the early part of his active life he wrote many articles for medical journals and later gave addresses on medical and nursing education and in public health interests in thirty-four states of the Union.

His relation to the Minnesota Academy of Medicine is of interest at this point. He was a Charter Member in the organization, founded in 1887. There is some question as to whether there were 37 or 38 charter members, but there is no question as to his status as he served as the Minneapolis Secretary until October 1889. During this same period Dr. E. C. Spencer served as Secretary for St. Paul. By October, 1889

co-secretaries seemed to be no longer necessary and Dr. Beard was elected Secretary-Treasurer, an office he filled until October, 1903, when he was succeeded by Dr. Arthur W. Dunning. On October 3, 1906, he was elected President and his presidential address, read at the meeting of November, 1906 was entitled: "The Relation of Physiological Chemistry and Physiological Microscopy to Medical Practice." Indicative of the character of his interests are the titles of the first two papers he read before the Academy, the first on June 1, 1889, on "The Causes of Infant Mortality" and the next in 1891, on "Physiology of Sleep and the Physiological Treatment of Insomnia." Dr. Beard was elected to honorary membership in the Academy on April 15, 1925.

He was a member of Alpha Kappa Kappa fraternity; honorary member of Hennepin County Medical Society, Minnesota State Medical Association, State Organization of Public Health Nursing; Fellow of the American Medical Association and the American Public Health Association; member of the American Hospital Association; honorary Fellow (formerly Secretary, Vice-President and President) of the Minnesota Academy of Medicine; and an honorary member of the National League of Nursing Education.

Dr. Beard stood foursquare for everything in which he believed. He was a trenchant speaker and fluent writer with an unusual command of the English language. His many students remember well his clean-cut characteristics of speech and action. He took an effective part in the movement which resulted in the affiliation of the Mayo Foundation with the University. Following that, he became the outstanding leader in the development of nursing education in Minnesota, a leadership which has had its effects far beyond the confines of this state. Dying just a few months short of his 80th birthday and invalidated for the greater part of the last year and a half of his life, he was unable to complete his last great wish—that it might be he who should write the first real history of the Mayo Clinic and its founders. His initiative, unremitting energy and determination were an example to all.

The Committee:
J. F. Corbett
H. L. Ulrich,
S. Marx White, *Chairman*

The scientific program followed.

SPINAL CORD TUMOR

E. M. HAMMES, M.D.

ST. PAUL

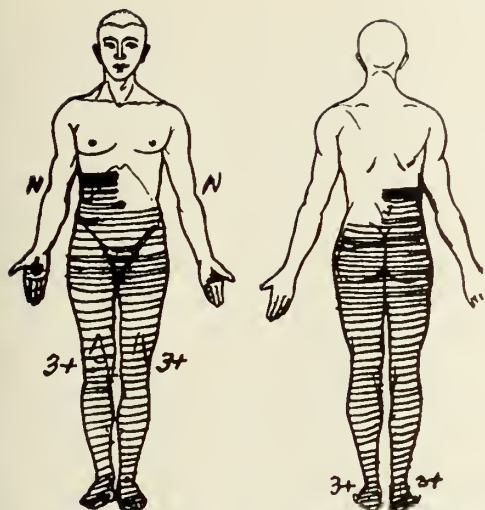
Dr. Hammes reported two cases of spinal cord tumor: (1) a typical textbook case, and (2) a most atypical case with rapid onset, a remission of several months, and a sensory level four dorsal segments lower than the tumor mass.

Case 1. The patient was a female, age 35, and was referred to us by Dr. W. C. Carroll, St. Paul, on December 12, 1935. The family and personal histories were negative except for an appendectomy at the age of 23 and a cholecystectomy at the age of 28.

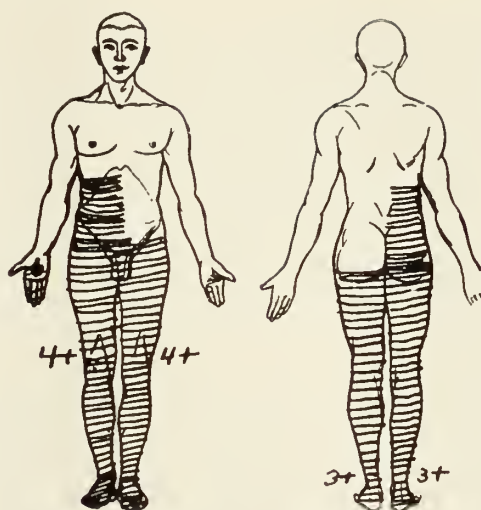
In July 1934 she began to have pain in the upper right abdominal quadrant. This manifested itself only at night while lying down. Because of continued pain and loss of sleep she lost 28 pounds during the following year. About July 1935, one year after the onset of her pain, she noticed a slight stiffness in her knees and ankles. Her gait gradually became unsteady, especially when walking in the dark or with her eyes closed. This stiffness was more pronounced in her right leg. About this time she noticed some numbness in her toes which gradually extended upward to the level of the knees. During the early part of November the right leg began to tire easily, and the knee and ankle had a tendency to "give way." There had been some edema of both ankles since the middle of October.

The pain continued, was aggravated by coughing and sneezing, and on November 3, 1935, an exploratory laparotomy was performed under spinal anesthesia. Numerous dense adhesions were severed, but the pain continued.

Neurological examination on December 12, 1935, revealed the



Case 1. Sensation: Over dark band—hyperesthesia. Over shaded area—tactile, pain and temperature sense impaired. Deep muscle and vibratory sense lost.



Case 2. Sensation: Over shaded area—tactile, pain, temperature, vibratory and deep muscle sense are impaired.

following: Cranial nerves and upper extremities negative except for a slight intention tremor of the right arm. The Romberg was positive with a tendency to fall to the right. She walked with difficulty and with a definite spastic gait. Both lower extremities were definitely spastic, the right more marked than the left. Both knee jerks were markedly increased with a bilateral patellar clonus. Both ankle jerks were definitely increased with a bilateral ankle clonus. There was a bilateral Babinski. While lying down she was able to execute the movements with the left leg more readily than with the right leg. There was a bilateral ataxia with the knee-heel test. This she executed with the right leg with great difficulty. There was no evidence of muscle atrophy, but slight edema with definite pitting of both ankles. The lower abdominal reflexes were absent; the upper ones were questionable. Sensation was normal over the face, both upper extremities, and the chest. On the right side about two inches above the umbilicus there was a band about one inch wide extending around the right upper abdomen. This band was somewhat hyperesthetic to touch and pain as compared to the left side. Below this there was a small band where touch and pain and temperature sense were quite normal. Immediately below this about one inch above the umbilicus and from there down over the remainder of the right trunk and right leg, touch, pain, and temperature sense were somewhat impaired but could be definitely recognized. Over the anterior surface of the right thigh to a short distance below the knee there was an indefinite area of hyperesthesia where pin pricks were quite painful. Over the left trunk from the level of the umbilicus, over the left trunk and the entire left leg, touch, pain and temperature sense were impaired but could be recognized. Position and deep muscle sense were lost in both lower extremities. Vibratory sense was lost over both ankles and both knees, with some impairment on the pelvic brim.

Her hemoglobin was 78 per cent; blood pressure 122/74; urine normal. The blood Wassermann was negative.

On January 6, 1936, a lumbar puncture was performed. The spinal fluid pressure was 14 mm. of mercury with some evidence of block. The spinal fluid presented a Nonne Froin syndrome. It was xanthochromatic and coagulated to a solid mass within thirty minutes. The Wassermann and colloidal gold tests were negative. Because of the spontaneous coagulation, no further tests could be made. There was no change in her symptoms following the lumbar puncture.

Roentgenologic studies of the spine were negative.

A diagnosis of non-malignant intradural extramedullary cord tumor, located on the right side at the level of the eighth dorsal segment was made. On January 27, 1936, a laminectomy was performed by Dr. Carroll, and a tumor was found at the level of the eighth dorsal segment, intradurally and attached to the

meninges. This was easily removed. It was the size of a large hazel nut.

The microscopic diagnosis was a meningioma. The patient made an uneventful convalescence.

Examination on March 6, 1936, was entirely negative except for some hyperesthesia over both thighs and some subjective complaint of stiffness of the toes.

Case 2. A male, age 36, a farmer, was referred to us by Drs. Kalinoff and Brekke, Stillwater, Minnesota, on October 25, 1935.

The family and personal histories were essentially negative.

In October 1934, the patient developed some pain in his left hip. This was constant for a week and then subsided. About two weeks later he developed marked attacks of flatulency and belching. This continued and on November 17, 1934, an appendectomy was performed, without relief. When he began to get about following the operation he noticed some weakness in his legs, especially the right one. He also had some involuntary urination which subsided in two weeks. The weakness in his lower extremities gradually grew worse. About January 1935, both legs had become so weak and spastic that he was unable to walk without assistance. He also had a return of his involuntary urination. This continued until about May 1935. He began to improve so that during July, August and September he was able to attend to his work on the farm, plow, run a mower, and walk over a mile daily. Early in October 1935, he had a rapid return of his symptoms. His lower extremities became spastic with occasional involuntary jerking, so that he was unable to walk without assistance. He was unable to void and had to be catheterized. There was no pain at any time.

About October 20, 1935, Dr. Kalinoff performed a lumbar puncture. The spinal fluid was yellowish, the Kolmer and Kline were negative, Colloidal gold curve 1233443211.

The neurologic examination on October 26, 1935, revealed the following: The pupils were equal and round and responded to light and accommodation. The fundi were normal. The fields of vision were normal on rough testing. The eye movements were normal and there was no nystagmus. All other cranial nerves were normal. Both upper extremities showed normal reflexes, normal sensation, normal muscle strength, no ataxia, and no tremors. We were unable to test the Romberg because he was so spastic and was unable to stand alone. Both lower extremities were markedly spastic with an occasional jerking of the musculature. There was a bilateral ataxia with the knee-heel test. Both knee jerks were markedly increased with a patellar clonus. Both ankle jerks were markedly increased and there was a bilateral ankle clonus. There was a bilateral Babinski. There was no evidence of atrophy or other trophic changes. He was unable to walk without a cane. The abdominal and

cremasteric reflexes were absent. Sensation was normal in the face, both upper extremities, and the upper portion of the trunk. From two inches above the umbilicus on the right side over the right half of the abdomen and the entire right leg, touch, pain, position, and deep muscle sense were impaired. On the left side from the level of Poupart's ligament down over the entire left leg there was some sensory impairment. Over this area the prick of a pin gave him a burning feeling.

A lumbar puncture was performed on October 28th and revealed the following: The spinal fluid was clear, pressure 8mm. of mercury, no evidence of bloc; 6 cells, a positive globulin, a negative Wassermann, and a colloidal gold curve 1234221000. Quantitative protein 150 mg. per 100 cc. All other laboratory findings and roentgenologic studies of the entire spine were negative.

Because of the high protein content, an intramedullary cord tumor was considered, but, in the absence of a spinal bloc and with the history of a marked remission during the summer of 1935, a diagnosis of multiple sclerosis was made. He was placed on quinine hydrochloride and triple typhoid vaccine. His bladder condition improved considerably, but there was no change in his sensory or motor symptoms. Within a month he had a return of his bladder symptoms.

On January 10, 1936, the spinal fluid was yellowish, there was some evidence of bloc, and the quantitative protein was 100 mg. per 100 cc. The sensory level remained constant, and a diagnosis of an intramedullary cord tumor at the level of about the seventh dorsal segment was made.

On January 22, 1936, Dr. Robert Earl performed a laminectomy, removing the fourth, fifth and sixth dorsal spinous processes. The cord appeared anemic, there was no pulsation, but no evidence of tumor or obstruction could be found. Because of the marked hemorrhage, further exploration seemed inadvisable.

The patient had an uneventful convalescence but no improvement in his symptoms.

On March 6, 1936, Dr. Earl performed another laminectomy and removed the second and third dorsal spinous processes. At the level of the fourth dorsal segment under the second dorsal spinous process an intra-medullary tumor about the size of a hazelnut was found. This was infiltrated and could not be removed. A small biopsy revealed that the tumor was a glioma. The surgical recovery was uneventful, and there was no improvement in his symptoms. The patient is still alive.

Discussion

DR. H. Z. GIFFIN (Rochester): I would like to ask Dr. Hammes how often he sees a cord tumor that does not cause pain which is relieved by moving around at night?

DR. HAMMES: The pain is relieved when the patient sits up and aggravated while in the recumbent posture, because in the sitting posture the tension of the posterior roots is lessened, due to the slight flexion of the vertebral column. This relief I believe occurs only in cord tumors so located that they produce some direct pressure on the posterior sensory roots.

DR. GIFFIN: What percentage of spinal cord tumors do not have that symptom?

DR. HAMMES: I cannot give the percentage, but we see many cord tumors in which a change of position has very little effect, if any, on the pain itself.

DR. S. MARK WHITE: (Minneapolis): Do you frequently find cases in which the tumor is located in the upper dorsal segments and the sensory level indicates a much lower dorsal segment lesion, such as occurred in your second case?

DR. HAMMES: The marked difference between the sensory level and the location of the tumor is quite infrequent. In the second case the tumor was small and intramedullary. The main pressure was probably exerted on the long posterior fibers, while the laterally placed sensory fibers escaped. The more centrally placed fibers, *i. e.*, those nearer the posterior septum, control sensation in the lower portion of the trunk and lower extremities. This may explain the marked difference between the sensory level and the tumor in this case.

DR. WILLIAM DAVIS (St. Paul): I was interested in what Dr. Hammes said about lying down increasing the pain, and

that the pain was better during the daytime, and that it was due to pulling on the sensory roots. Wouldn't that explain what I have noticed in several cases of herpes zoster, that the patients have less pain when upright, especially in cases of herpes zoster where the dorsal or lumbar nerves are affected?

DR. HAMMES: I do not know, but that would seem a logical explanation.

DR. W. H. HENGSTLER (St. Paul): One of the interesting things about that second case was that the man showed early bladder involvement. That is an interesting point in the diagnosis of intramedullary tumors. They frequently show bladder involvement before anything else. I think it is an important thing that he had bladder involvement early in the disease, from the diagnostic standpoint.

A SUGGESTION IN THE TECHNIC OF CHOLECYSTECTOMY FOR THE COMPLICATED CASE OF GALLBLADDER DISEASE

HARRY P. RITCHIE, M. D.

ST. PAUL

Dr. Harry P. Ritchie, of St. Paul, read a paper on the above subject, and showed lantern slides of the technic of the operation.

Abstract

A plan for removal of the gallbladder was suggested for those cases wherein a risk of injury to structures about the gallbladder is possible in the attempt at cholecystectomy by the formal up-down or down-up methods of procedure.

The first step is to split the gallbladder by a median incision, a distance from the dome to a point where the opening of the cystic duct is identified from within. The second step is to "wing" the gallbladder by two parallel incisions made in the same direction as the first, and far enough away from the normal attachments of the gallbladder to the liver to preserve them completely. The "wings" of the gallbladder are removed. These two steps leave a situation which can be pictured as a ladle, the handle of which is the strip of the gallbladder wall with its mucous membrane lining and its normal attachments to the liver; the cup of the ladle is the mucous-membrane-lined base of the gallbladder. The third step is the dissecting of the mucous membrane of the handle and the cup away from the wall, thus removing the mucous membrane entirely. The fourth step is the suturing of the wall of the cup about a drainage tube and the suturing of the wall of the handle to diminish raw surfaces and control bleeding.

The main objection to the plan is that, by opening the gallbladder so widely, infectious agents are released upon the peritoneum. This is a valid objection, which the surgeon must consider in each case on the question of cholecystectomy and drainage on the one hand, or the attempt to remove the gallbladder by formal methods under difficult and dangerous circumstances.

The justification for the procedure is found in the studies of Andrews on the infectious nature of the gallbladder contents. Andrews questions the appropriateness of the term "empyema of the gallbladder." His studies fit into the clinical experiences of the writer in sixteen cases of cholecystectomy performed by the above-described method over a period of fifteen years. In this small series of selected cases, the mortality has been nil. In only one case was there postoperative concern; the story of this case was reported in detail.

Emphasis was made in the plea that such unusual surgery should not be interpreted as a substitute for formal steps, but was offered only as an emergency procedure in certain combinations of circumstances. The plan meets the surgical principle of any cholecystectomy, which is the removal of the mucous membrane of the gallbladder, and eradicates the danger of injury to the common duct and traumatism to and exposure of denuded surfaces of the liver.

Discussion

DR. E. M. JONES (St. Paul): Dr. Ritchie's paper is very interesting. These severe gallbladder cases often give the surgeon a great deal of concern. I recall two cases in particular, in which it would have been wiser to have followed some such

procedure. In doing a cholecystectomy, the clamps applied to the cystic duct cut through. It was necessary to apply the clamps to the cystic artery and the cystic duct and leave the clamps in situ. Fortunately, both of these patients recovered.

DR. RITCHIE (in closing): There are causes of obstruction of the biliary ducts other than surgical traumatism, but the surgeon is challenged when this condition follows operation. There are procedures in the literature which remove most of the wall and mucous membrane, leaving a part of the gall-bladder with the normal attachments to the liver, just as I have illustrated. Thorek does so, then destroys the mucous membrane of the handle and cup with the endotherm, brings over the falciform ligament and sews it to the outer margin of the handle. Raymond McNealy iodizes the mucous membrane after winging the gallbladder and uses the ligament to protect the peritoneal cavity. Denegre Martin, of New Orleans, in 1921 and again in 1926, reports a series of cases treated along similar lines. All of them report satisfactory recoveries. When I read their reports, I wonder whether I have made a mountain out of a molehill. But I believe the surgical dissection of the mucous membrane is founded on proper principle. As I pointed out in the paper, what I suggest is that an old gynecological operation be applied to the complicated case of gallbladder disease.

MALIGNANT HYPERTENSION

MOSES BARRON, M.D.

MINNEAPOLIS

Abstract

There are several synonyms, such as malignant nephrosclerosis, malignant arteriolar sclerosis, malignant phase of essential hypertension. Essential hypertension is extremely common. It was first identified after the invention of the sphygmomanometer by von Basch in 1893, separating essential hypertension from that associated with glomerulonephritis. Volhard differentiated between "pale" hypertension of nephritis and the "red" hypertension of the essential type. The former is supposed to be associated with a pressor substance circulating in the blood which is liberated in the later stages by the kidney parenchyma. The latter is the result of arteriosclerotic changes with hypertrophy of the elastica and hyalinization in the precapillary arterioles. Constitution seems to be the only definite etiological factor so far known. Essential hypertension is not common before 40; is most common between 50 and 60. The histology shows a degenerative change in the peripheral arteries and arterioles producing rather rigid tubes and increasing the peripheral resistance. In the early stages there is increased vasomotility with marked fluctuation in the blood pressure. This is elicited by Brown's "cold" test for early stages of hypertension.

The benign hypertension is a chronic ailment, and may run for ten to twenty-five years. The termination is either from congestive heart failure, coronary disease or cerebral hemorrhage. About ten per cent of the deaths are due to renal insufficiency. A few of these kidney deaths are due to a gradual obliteration of individual glomeruli resulting in shrinking of the kidney. This may go on to renal insufficiency. This type, however, is not included in malignant hypertension.

Another small group may be the result of a true glomerulonephritis being superimposed upon the benign hypertension.

By malignant hypertension is understood a condition in which there is usually a history of hypertension, of longer or shorter duration, upon which there is superimposed a rapidly developing and progressive renal insufficiency. The blood pressure rises, the patient becomes pale, loses his appetite, develops weakness, becomes apathetic, sensorium becomes cloudy; there is usually a complaint of severe headache. Examination shows a very high blood pressure, very little edema as a rule, more or less anemia, heart enlarged and pounding, and eye-grounds show evidence of an angiospastic condition of the blood vessels with degenerative changes in the retina; the picture is what is known as hypertensive neuroretinitis or neuroretinopathy. There often is no congestive heart failure associated with it but there may be mild or even severe degrees of heart failure accompany-

ing the kidney change. It occurs principally in younger persons between thirty and forty-five. The blood chemistry will show a retention of metabolites and the patient will proceed rapidly into true uremic coma and will die in uremia, often in convulsions.

The clinical picture is, therefore, one which starts as a benign hypertension, upon which is superimposed the *clinical* findings of a true nephritis which ends in uremia. Pathologically the kidneys show lesions other than those from a glomerulonephritis. There is extensive degeneration often with necrosis of the arteriolar vessels in the kidney and also endarteritis which bring about the ischemia of the glomeruli and the resultant renal insufficiency. Several cases were reported illustrating the condition.

Discussion

DR. JOHN F. NOBLE (St. Paul): Dr. Barron approached me just before the meeting and inquired whether or not I was the only member of the department of pathology present. He seemed relieved when he found I was the only representative present. I find his pathological concepts sound and orthodox. With reference to his clinical description of the red and pale hypertensive patient, representing respectively the case of malignant hypertension and the patient with chronic glomerulonephritis, let me say that, while early in the disease this may be of some value, later when uremia develops, the patients become very anemic in both instances.

I would also like to emphasize the fact that late in the picture clinical differentiation is very difficult and sometimes even histologic studies are confusing. Special stains are frequently necessary to arrive at a correct diagnosis.

The term malignant hypertension is frequently used very loosely. Dr. Barron has defined malignant hypertension as having certain definite characteristics, namely, rapid onset of uremia and typical necrotic lesions in the arterioles of the kidney. If this term is to be used, I believe some such definition should be made.

DR. H. W. GRANT (St. Paul): I think this question is important from the standpoint of the ophthalmologist because he is constantly coming in contact with cases of choked disc associated with the characteristic general picture of which Dr. Barron has spoken. Ordinarily it is usual to recognize in examination of the fundus three types of cases: the arteriosclerotic, the atheromatous sclerosis, and the essential hypertension in its various stages. Atheromatous sclerosis may be present from birth or until sixteen years of age, and then usually has a tendency to disappear until later life. Usually the characteristic picture of essential hypertension is an infiltration of the vessel wall. This has a tendency to produce an infiltration of the arteriovenous crossing, as these vessels have a common outer coat. Not all changes at the arteriovenous crossings are, however, of this nature, as some distortion at this point may be produced by contraction of the arterial wall without any infiltration. Following the infiltration of the vessel wall there are likely to be hemorrhages because of the necrosis which results. It is much less likely that hemorrhage results in an atheromatous sclerosis because of the actual thickening of the vessel wall. Apparently all cases of choked disc dependent upon malignant hypertension do not have characteristic findings. Some are present without headache, which is usually one of the more pronounced symptoms. They do, however, have the piling up of fat in the superficial retinal layers probably due to the fact that the lipid content of the retina is higher than that of any other structure of the body, the brain ranking second. This fat is likely to be dissolved out in most sections, but can easily be demonstrated in flat sections of the retina which are unstained.

DR. BARRON (in closing): Dr. Noble asks about the question of the "paleness" in malignant hypertension. I suggested its cause in the discussion but did not emphasize it enough. The "paleness" is due, first, to the spastic condition of the blood vessels, and, second, to the development of the anemia. It is true that in some cases it is not easy to differentiate nephritis from malignant hypertension by the microscopic sections. In a few cases we have true glomerulonephritis super-

imposed upon the benign hypertension. In malignant hypertension there is no evidence of inflammatory changes which can be seen in glomerulonephritis. The endarteritis is an important finding emphasized by the authorities and it is not due to inflammation.

As to the question about necrosis, we do not believe that the hyalin change seen in the arterioles of essential hypertension is a necrotic one. It seems to be due to a certain degenerative change of the fibers into hyalin material. The staining reaction is often different from that of necrotic material.

After the scientific program, Dr. Barron showed motion pictures which he had taken last summer on the Academy's trip on the Mayo yacht, and also at a picnic which had been held at Dr. Archibald Wilcox's summer home.

The meeting adjourned.

A. G. SCHULTZE, M.D.

Secretary.

Grafton, North Dakota, Passes a Fracture Ordinance With a Penalty Clause

ORDINANCE NO. 115

An Ordinance Regulating the Equipment and Operation of Ambulances Within the City of Grafton, North Dakota.

BE IT ORDAINED by the City Council of the City of Grafton, North Dakota:

SECTION 1. No person, firm or corporation shall operate or cause to be operated any ambulance, public or private, or any other vehicle commonly used for the transportation or conveyance of the sick or injured, without having such vehicle equipped with a set of simple first aid and splint appliances approved by the Superintendent of the Board of Health and having in attendance at all times such vehicle is in use a person who has obtained a certificate of fitness as an ambulance attendant from the said Superintendent of the Board of Health.

SECTION 2. Any person desiring a certificate as an ambulance attendant shall make application in writing therefor to the Superintendent of the Board of Health. Before the issuance of any such certificate the applicant therefor must present evidence of his qualifications to fill such position and must demonstrate to the satisfaction of the Superintendent of the Board of Health his ability to render emergency first aid and to supply approved splints to arm and leg fractures.

SECTION 3. Any person violating the provisions of this ordinance shall in each case be subject to a penalty of not less than Five (\$5.00) Dollars nor more than Twenty-five (\$25.00) Dollars, and as to the like penalty for each week he shall fail to comply with the provisions thereof or continue in the violation of same to be recovered in any Court having jurisdiction.

SECTION 4. This ordinance shall take effect and be in force from and after its passage, approval and publication.

First Reading March 1, 1937.

Second Reading and Final Passage April 5, 1937.

Publication April 14, 1937.

Approved this 5th day of April, 1937.

HENRY L. SIEG,

Mayor.

Filed in my office this 5th day of April, 1937.

W. F. SCHUTT,

City Auditor.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

St. Paul, Minnesota

DOCKET OF CASES

STATE OF MINNESOTA *versus* JOHN STANLEY, also known as WILLIAM STANLEY.

STATE OF MINNESOTA *versus* BILLY STANLEY, also known as BILLIE STANLEY.

On May 15, 1937, Sheriff Arthur Brown and two deputies, George Kelly and Arthur Murray, arrested two "Indian doctors" in Crooked Creek Township, Houston County, Min-

nesota. On May 16 they pleaded guilty before Mr. Jerry Kenny, a justice of the peace, to selling herbs and drugs, having no medicinal value. Billie Stanley, who deposed that she was the wife of John Stanley's father, was fined the sum of \$40.00 and \$20.00 costs, which was paid. John Stanley was put on probation to the sheriff, and both defendants, together with the husband of Billy Stanley, were given 24 hours by the Court to leave the State of Minnesota. The two defendants claimed to be 22 years of age, and to be of Osage and Cherokee ancestry. They claimed to have been living in Minnesota less than 30 days, and to have been residing near Canton, Minnesota.

The Minnesota State Board of Medical Examiners commends Sheriff Brown and his deputies, and also Mr. L. L. Roerkohl, county attorney of Houston County, who handled this case.

NEWS ITEMS

A \$50,000 addition to the Kalispell General Hospital in Kalispell, Montana, will be erected soon.

Dr. Oscar C. Heyerdale, for 38 years associated with the Rochester State Hospital, operated by the Minnesota State Board of Control, will retire on July 1.

The Knights of Columbus of Devil's Lake, North Dakota, donated \$800.00 to Mercy Hospital in Devil's Lake on April 26.

Dr. Donald Emerson Hale, a member of the Butte Clinic, Butte, Montana, spoke before the Butte Exchange Club on April 13 on "Modern Surgery."

Dr. Edward Harold Frost, Willmar, Minnesota, is the new president of the Great Northern Railway Surgeons' Association.

Dr. A. G. Berger, a graduate of the University of Minnesota School of Medicine, is the new city quarantine officer for Minneapolis.

Dr. William Edward Macklin, Jr., of Litchfield, Minnesota, has moved his offices to the second floor of the Askeroth Building in Litchfield.

Dr. Robert Wilson Campbell, Cass Lake, Minnesota, has moved to new offices in the Cass County Hotel building.

The Right Reverend Bishop Bernard J. Mahoney, of the Sioux Falls diocese, officiated at the dedication of the new annex to Saint Joseph's Hospital in Sioux Falls on April 14.

Sister M. Jolenta, O. S. B., for 26 years nurse and supervisor of Saint Alexius Hospital in Bismarck, North Dakota, died on April 20 in the hospital. She was born on April 30, 1889, at Buckman, Minnesota.

Dr. Fred Franklin Attix, of Lewistown, Montana, spoke at a public mass meeting to further the women's field campaign against cancer held at the Lewistown Junior High School on April 28, 1937.

A gift of \$36,000 from the Rockefeller Foundation to be used for research in biology and medicine, has been accepted by the Board of Regents of the University of Minnesota.

The Northwest District Medical Society of North Dakota held its monthly meeting in St. Joseph's Hospital at Minot on April 29. Dr. E. M. Ransom, Minot spoke on "The Diagnosis of Placenta Previa."

Dr. Arthur Raymond Zintek, a graduate of the Marquette University School of Medicine in Milwaukee, Class of 1934, has located in Lancaster, Minnesota, according to dispatches.

Dr. John William Campbell, of Fargo, North Dakota, who was graduated from the Rush Medical College of the University of Chicago in 1897, will locate in Hutchinson, Minnesota.

Dr. Jacob Thorkelson, of Butte, Montana, was in charge of examination of pre-school children who expect to enter grade school at the next term in Butte. Examinations began on April 26.

More than 3,500 schools in South Dakota have taken part in the South Dakota Public Health Association's health poster contest, representing 45 counties of the state.

Dr. Homer Harold Hedemark, of Robbinsdale, Minnesota, a graduate of the St. Louis University School of Medicine in 1933, is now a member of the Bratrud Clinic at Thief River Falls, Minnesota.

Dr. Robert Hugh Ray, of Garrison, North Dakota, has been discussing plans with Dr. J. B. Simons and Dr. Edwin J. Simons, of Swanville, Minnesota, for a new municipal hospital for Garrison.

There are now 40 public health nurses, subsidized by the North Dakota State Health Department, operating in about 40 counties of the state, according to Dr. Maysil Williams, chief of the department.

Dr. Desmond Thysell, who was graduated from the University of Minnesota Medical School in March 1937, began work as city physician in the Minneapolis General Hospital on April 1st.

By action of Governor William Langer, May 12 was declared National Hospital Day for North Dakota. May 12 was the birthday anniversary of Florence Nightingale.

Owing to the fact that medical care for the poor patients of Codington County in South Dakota cost \$230.68 during March 1937, the county commissioners have decided that a revision in the fee schedule of the 1937 county contract is necessary.

Dr. Russell Aanes, son of Dr. and Mrs. A. M. Aanes, of Red Wing, Minnesota, has finished his internship at General Hospital in Minneapolis, and will be associated temporarily with his father in the Medical Lock clinic in Red Wing.

The South Dakota State Planning Board has sent a resolution favoring amending a bill to authorize a 100-bed veterans' hospital in Eastern South Dakota. The board's amendment calls for a 175-bed hospital, and an increased appropriation.

Dr. Herrick John Aldrich, a graduate of the University of Minnesota Medical School in 1935, has returned from the Lake Kabetogama Civilian Conservation Corps medical unit to enter practice with Dr. John Francis Briggs, of St. Paul, Minnesota.

Dr. Arthur C. Strachauer, professor of surgery in the Medical School of the University of Minnesota gave a public lecture on cancer in conjunction with the

annual meeting of the Iowa State Medical Association at Sioux City, Iowa May 12th, 1937.

Dr. Joseph T. Newlove, for 41 years a physician at Minot, N. D., died on April 16. Dr. Newlove was graduated from the Wayne University College of Medicine in Detroit, Michigan, in 1896. For 20 years he was a member of the Minot Park Board.

The new government hospital for Indians at Wagner, South Dakota, was opened on April 3, 1937, by the Wagner Chamber of Commerce. Dr. George Hopson, formerly of the Rosebud Agency Indian Hospital, is superintendent.

Whitney Memorial Building, the new \$275,000 wing of Saint Barnabas Hospital in Minneapolis, was dedicated on April 17 by Bishop Frank A. McElwain and Bishop Coadjutor Stephen E. Keeler, of the Protestant Episcopal Church.

Dr. John Thompson Bowers, Bemidji, Minnesota, dropped dead on the evening of May 20, 1937, at his residence, Shoreacres, on Lake Bemidji. Dr. Bowers was graduated from Northwestern University Medical School in 1908.

Dr. John Patrick Bartle, a graduate of the University of Manitoba Medical School in 1934, will locate in the Backes & Johnson Building in Langdon, North Dakota. He formerly was with the North Dakota State Tuberculosis Sanatorium at San Haven.

Dr. Emil Gunvald Ericksen, health officer of Sioux Falls, South Dakota, told the Sioux Falls Junior Chamber of Commerce how the city health department's examination of milk supplies and health tests for food handlers, are conducted. He spoke before the organization on April 29.

The American Student Health Association, for which THE JOURNAL-LANCET is the official journal, announces its editorial committee for 1937 to be: H. D. Lees, M.D., University of Pennsylvania; D. F. Smiley, M.D., Cornell University; and Ruth E. Boynton, M.D., University of Minnesota.

The post hospitals at Fort Snelling, Minnesota, are to be altered, with additions to certain structures, according to advice from Major Phillip B. Fryer, Quartermaster Corps, United States War Department, at Washington, D. C. Major Fryer will open bids after May 28, 1937.

Dr. George W. Swift, of Seattle, Washington, held a brain clinic in Anaconda, Montana, before the Mount Powell Medical Society on April 30. Dr. Walter A. Fansler, assistant professor of surgery in the University of Minnesota Medical School at Minneapolis, spoke on "Carcinoma of the Rectum and Sigmoid."

Henry Clinton Cooney, M.D., of Princeton, Minnesota, founder of Northwestern Hospital in Princeton, and widely-known throughout Minnesota, was tendered a dinner at Princeton on April 19 by many friends, on the occasion of his 75th birthday. Dr. Cooney was graduated from the University of Illinois College of Medicine in 1887, and licensed the same year.

The nursing schools of the Kennedy Deaconess Hospital in Havre, Montana, the Great Falls Deaconess Hospital, and the Bozeman Deaconess Hospital in Bozeman, will be consolidated to form the Consolidated Deaconess School of Nursing, offering the degree of Bachelor of Science in Nursing, according to officials.

Dr. Maysil M. Williams, state health officer of the North Dakota Public Health Department, and a graduate of the University of Toronto Faculty of Medicine in 1921, was elected vice president of the State and Territorial Health Officers' Association of America at Washington, D. C., recently.

Dr. Alphonso James McLaughlin, who was born in Lyle, Minnesota, in 1876, and who has practiced at Sioux City, Iowa, for many years, died in Sioux City on April 18. He was a member of the American College of Surgeons, and of the American Urological Association.

The regular meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on May 12, in St. Paul. Dr. J. A. Johnson, Minneapolis, spoke on "Tumors of the Jejunum;" and a case report, "Adamantinoma With Cyst of the Lower Jaw," was presented by Dr. A. R. Colvin, St. Paul.

Assistant Superintendent B. A. Dyar, M.D., of the State Board of Health of South Dakota, announces that a medical care program for standard loan resettlement administration clients became effective in South Dakota on May 1. It operates through the South Dakota Farmers' Aid Corporation, of which Dr. Dyar is medical supervisor.

The regular monthly meeting of the Northwest District Medical Society was held at Trinity Hospital in Minor on Thursday, May 27th, 1937. Dinner was served by the hospital at 6:15 P. M. Dr. Irvine McQuarrie of the Department of Pediatrics of the University of Minnesota, spoke on the subject of "Convulsive Disorders of Childhood."

Dr. George Fahr, associate professor of medicine in the University of Minnesota Medical School at Minne-

apolis, spoke before the Washington County Medical Society at Stillwater on April 11 on "Hypertension." Dr. Everett K. Geer, St. Paul, assistant professor of medicine, interpreted several Mantoux reactions of students.

Dr. Myron O. Henry, of Minneapolis, was recently made a member of the Chicago Orthopedic Society and at the February meeting, which was a joint meeting of the Chicago Orthopedic Society and Chicago Roentgen Society, read his inaugural thesis on "Chip Grafts in Orthopedic Surgery."

For June, the radio broadcast of the Minnesota State Medical Association is as follows: June 5, "Avitaminosis;" June 12, "Water Cures;" June 19, "Diverticulitis of the Colon;" and June 26, "Calcium and Denistry." The speaker is Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota Medical School.

The annual spring conference of the Fourth District Medical Society of South Dakota met at Pierre on April 16. Dr. Joseph Charles Murphy, Murdo, was elected president; Dr. Isaiah Reed Sallidy, Pierre, was chosen vice president; and Dr. Clarence Edward Robins, Pierre, was voted secretary-treasurer. Dr. Olir A. Kimball, Murdo, attended the meeting of the South Dakota State Medical Association at Rapid City on May 24 as the Society's delegate.

On Saturday, June 19, Northwestern Hospital of Minneapolis will hold a reunion and homecoming for its former interns. From 8:00 A. M. Saturday to 1:00 P. M. there will be clinical and scientific demonstration in the hospital by the staff; at 3:00 P. M. Saturday the gathering will take a boat ride on the *Donna May* which cruises the Mississippi River under command of Captain W. G. Holstrom. Dr. Arthur E. Benjamin 1727 Medical Arts Building, and Dr. William Arthur Hanson, 1005 Medical Arts Building, Minneapolis, are in charge; and would like to have every former intern of Northwestern Hospital communicate with them for this celebration.

BOOK NOTICES

A PEDIATRICS SPECIALTY

Reading, Writing and Speech Problems in Children, by SAMUEL TORREY ORTON, M.D.: 1st edition, grey cloth, library label. 200 pages plus glossary, line cut illustrations; New York City: The W. W. Norton Company: 1937. Price, \$2.00.

Dr. ORTON has specialized for many years in psychiatry and neurology, having been professor of neurology and neuropathology in the Columbia University College of Physicians and Surgeons until recent years.

His book considers not only the etiology of childhood neurological disorders, but also the approved methods of treatment. He points out the evils of forced correction by parents. This book represents Professor ORTON's summarized Thomas W. Salmon Memorial Lectures given before the New York Academy of Medicine. The work is not extensive enough to be called a full-fledged text; but it is useful and its value should be apparent to every pediatrician.

R. R., M.D.,
St. Paul, Minnesota.

A VALUABLE PEDIATRICS BOOK

Diseases of the Newborn, by ABRAHAM TOW, M.D.: 1st edition, cloth. 477 pages and 53 illustrations; New York City: The Oxford University Press: 1937. Price \$6.50.

This volume of 461 pages of text contains practical consideration of the general physiology of the new-born, of the care and feeding of premature and full term infants, of the disease and congenital malformation of the skeletal, digestive, respiratory, genito-urinary, and the nervous system of the new-born. Chapters are also devoted to blood dyscrasias, to diseases of the eye, ear and nose, to infections and septic diseases, to disease of the skin, and to a few special topics. A total of 58 illustrations and 580 references to the literature are included in the text.

This volume presents condensed and conservative discussion of a wide variety of conditions peculiar to new-born infant. It should prove to be a valuable addition to the libraries, particularly, of physicians who are responsible for the care of the babies they deliver.

The author is adjunct professor of pediatrics in the New York Polyclinic Medical School & Hospital, New York City.

C. A. STEWART, M.D.
Minneapolis, Minnesota.

The JOURNAL LANCET

Minneapolis, Minnesota
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Vol. LVII, No. 7
New Series

Fulminating Laryngotracheo-Bronchitis[†]

Nelson A. Youngs, M.D.*

Philip H. Woutat, M.D.*

Grand Forks, N. D.

FULMINATING laryngotracheobronchitis[†] is a non-specific infection of early childhood that attacks the respiratory mucosa, causing respiratory embarrassment and in a large number of cases, death from asphyxia. The asphyxia is caused by glottic spasm and subglottic swelling,¹ plus the formation of mucopurulent plugs in the bronchi. Swelling of the lining mucosa of the main and secondary bronchi is also a factor in some cases.

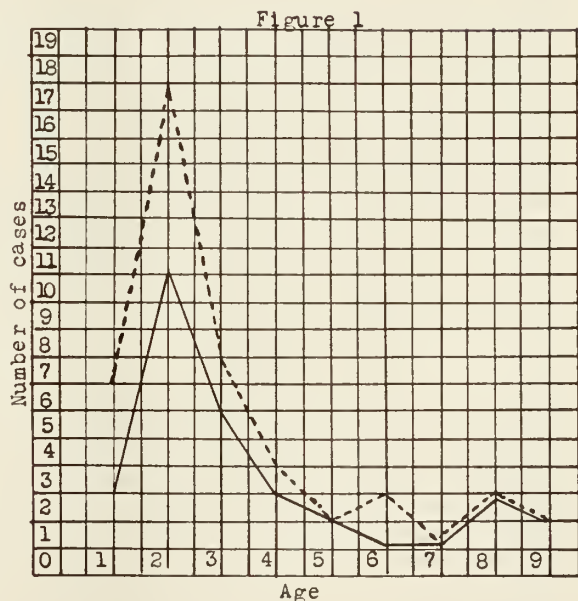
The onset is insidious. These children play and react normally except for a croupy cough, until the slowly forming obstruction becomes severe enough to cause oxygen deficiency. Then, with startling rapidity, the cardinal signs of laryngeal obstruction and anoxemia develop.

According to Jackson,² these signs are: ashy-gray pallor, anxious expression, rapid, labored respirations, fast pulse, restlessness, supra-sternal retraction, infra-sternal retraction, and intercostal indrawing.

The seriousness of this condition may be better understood from the fact that of 115 cases reported in the literature 1, 3, 5 and 9 to 24 incl. in the past ten years, plus the four cases we are now reporting, making a total of 119 fulminating cases, there were 59 deaths. The ages of these children varied between 10 months and 9 years. Around fifty per cent occurred in children 2 years old. Figure I shows the age distribution and mortality according to age.

[†] We have arbitrarily accepted fulminating laryngotracheobronchitis to be any laryngotracheobronchitis of such severity as to demand tracheotomy or intubation to prevent asphyxia.

* From Healy, Law, Woutat, Moore Clinic, Grand Forks, N. D.



The dotted line, figure I, represents the number of cases, while the solid line represents the fatalities according to age.

The bacteriology is non-specific. Richards,³ in reporting a series of eleven cases, of which seven were fatal, says, "The streptococcus hemolyticus is the organism most frequently found. In cases with a superimposed staphylococcal infection the destruction of the tracheal mucosa is more marked."

In both of our fatal cases, pure cultures of staphylococcus pyogenes albus were recovered from the tracheal secretions. Beare¹ reported a fatal case in which the staphylococcus was recovered in pure culture from the blood stream at autopsy.

Report of Cases

Case 1—M. M., female, aged 2. The patient was first seen on the evening of February 14, 1934, with a history of a cold and croupy cough since the preceding day.

On examination, signs of laryngeal obstruction were present.

Direct laryngoscopic examination revealed marked swelling of the vocal cords and a considerable amount of mucopurulent material in the trachea. The breathing space was inadequate, and a tracheotomy was performed.

Subsequent course was very stormy due to the formation of numerous obstructing bronchial plugs, which were removed by the following technique:

The patient was laid across the bed with head and shoulders hanging far enough over the edge to bring the chest into an inclined position. The operator sat on a low stool with the patient's head between his knees. A small French catheter, with the tip cut off and the edges rounded, was connected to a record syringe filled with warm sterile normal saline solution. The tip of the catheter was then inserted through the tracheotomy wound as far as the bifurcation and sometimes well into the main bronchi. From five to ten cc. of normal saline solution was then injected as the catheter was withdrawn. Another catheter connected to a suction apparatus was then quickly inserted and the trachea and main bronchi aspirated. Most of the liquid ran out or was coughed out during the procedure. The remainder was removed through the suction apparatus together with the loosened secretions and plugs. Three or four such irrigations were sometimes necessary at a sitting to clear the air passages.

In this manner, obstructing plugs were removed a total of 43 times over an eleven-day period. We have been unable to find a similar report of pulmonary irrigation used in this condition. We found it to be superior to bronchoscopic removal of plugs in those instances where the obstruction was due to numerous small particles. Decannulization was accomplished on the 39th post-operative day. The patient has remained well since this time.

Case 2—N. A., male, aged 4. The patient was first seen April 12, 1933, with a history of an upper respiratory infection and hoarseness since April 11. Respiratory effort had been slowly increasing since the day before.

Examination revealed a well-nourished and developed boy. The temperature was 100° F. by rectum, pulse rate 130 per minute, and respirations 38 per minute. The rest of the examination was entirely normal except for a red throat and signs of laryngeal obstruction.

Direct laryngoscopic examination revealed consider-

able subglottic swelling. The breathing space was inadequate and a tracheotomy performed. Although the time taken for these procedures was not excessive, the patient was in a critical condition from lack of oxygen before completion of the tracheotomy.

Although repeated cultures were negative for the diphtheria bacillus, 20,000 units of antitoxin were given. Convalescence was complicated by the formation of mucous plugs which were removed by suction. Decannulization was accomplished on the thirteenth postoperative day.

Case 3—R. J., female, aged 18 months. The patient was first seen on the evening of December 7, 1934, with a history of a cold and croupy cough for the past two days. Since morning, respiratory effort had slowly increased.

On examination, the temperature was found to be 101° F. by rectum, lungs clear, heart normal, and all the cardinal signs of laryngeal obstruction present.

Direct laryngoscopic examination revealed the presence of marked inflammatory swelling of the mucosa which bled easily. The breathing space was inadequate and a tracheotomy performed.

Subsequent course for the first twenty-four hours was fairly satisfactory, although symptoms of oxygen want were never completely relieved. In spite of every effort to keep the air passages open, the patient died on the third postoperative day.

Repeated tracheal aspirations, steam, expectorants, in tracheal oxygen were used, as well as repeated bronchoscopic examinations to rule out obstructing plugs.

Bronchoscopic appearance of the trachea and bronchus was unusual. The mucosa was markedly swollen and inflamed, the carina was greatly thickened, and the mucosa covered with patches of dirty gray scales of dried secretions. However, there was nothing large enough to remove with a bronchoscopic forceps.

Repeated cultures were reported as pure culture of staphylococcus pyogenes albus. Permission for autopsy was refused.

Case 4—D. S., male, aged 10 months. The patient was first seen at 11:00 P. M., October 10, 1935, with a history of a cold and croupy cough for a few days. He had felt well enough to play with other members of the family at supper-time, but at 8:30 P. M. the cough became worse, and respiratory effort developed. When we saw him he was in *extremis*, with all the signs of anoxemia and laryngeal obstruction. Oxygen was administered while a quick tracheotomy was performed.

He responded somewhat after the tracheotomy, but the pulse and respirations remained high. All the supportive measures at our command such as removal of tracheal secretions by frequent suction through a small catheter inserted down to the bifurcation and continuous intratracheal oxygen failed. The patient died the next afternoon. His condition at all times was too precarious to subject him to a bronchoscopic examination, or irrigations as used in Case 1.

Post-mortem

Examination of larynx, trachea, and bronchi revealed only moderately swollen vocal cords with marked subglottic swelling. The entire respiratory tract to the terminal bronchioles contained a large amount of mucopurulent debris. Pressure on the lung parenchyma, in many areas, caused thick yellow pus to exude into the bronchi.

A pure culture of staphylococcus pyogenes albus was recovered from tracheal secretions before death. Cultures could not be made at the time of autopsy because the body had been embalmed; but smears showed the presence of gram-positive coccus forms and no other organisms.

Treatment

There is no specific treatment for this condition. The laryngeal obstruction is overcome by either intubation or tracheotomy. Some authorities¹ favor intubation because they feel that the formation of bronchial plugs is lessened. We feel that tracheotomy should be the procedure of choice, unless a trained individual is at all times available to reinsert or clean the intubation tube in case it is coughed out or becomes plugged with secretions.

Some authors² have found tracheal plugs already present at the time of tracheotomy. These are easily removed by bronchoscopic manipulation through the tracheotomy incision or by lavage as practiced by us in Case 1.

It is very important that these patients be constantly watched by a nurse who has been instructed, and can recognize early signs of oxygen want. These patients may pass from a state of relative comfort to one of extreme oxygen-want in a very short time.

It is very essential that body fluids be maintained; and if the proper amounts are not taken by mouth, hypodermoclysis or intravenous therapy must be resorted to.

Drug therapy has little to offer in the treatment of this condition. Jackson⁷ recommends alkalies, and warns against the use of sedatives. Most authors recommend an expectorant.

Repeated small transfusions are of value because they increase the body fluids, stimulate the hematopoietic system and possibly contain antibodies.

If bronchoscopic inspection shows that a large part of the obstruction is due to swelling of the mucus membrane, oxygen therapy should be instituted early either by piping oxygen through a catheter directly into the tracheotomy tube, or by placing the patient in a tent, with the amount of oxygen regulated according to Waters' technique.⁸

If bronchoscopic equipment is not available, lavage as used by us in Case 1 offers the only method that we know of for removing these obstructing plugs.

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Tularemic Pneumonia*

E. G. Hubin, M.D.**

Deerwood, Minnesota

MCROY, of the United States Public Health Service, reported tularemia as a disease of rodents in 1911. Ten years later, Edward Francis, also of the Public Health Service, discovered

several instances of human tularemia, and since then upwards of 600 cases have been reported. It is a widespread disease, being found in practically all states, in Canada, and in several foreign countries.

Tularemia is characterized by an acute onset with chills, fever, headache, vomiting, and prostration. The

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**Superintendent, Deerwood Sanatorium

portal of entry is usually a scratch or sore on the hand; or the germs may gain entrance through the eye, or through the gastrointestinal tract, or even through the intact skin. Wild rabbits are the commonest source; but many other animals, including squirrels, muskrats, and opossums, have been found infected, as have also the grouse and horned owl. Handling such animals, or eating poorly-cooked meat from them, is the mode of transfer to man. The common wood-tick is also responsible for numerous cases of human tularemia. It feeds first on an infected animal, and then passes the germs on to its human host. The same applies to the deer fly.

The disease in man is probably always a bacteremia, the infecting organisms circulating freely in the blood stream. Any organ of the body may therefore become secondarily involved, i.e., lungs or nervous system. The acute stage usually lasts two or three weeks, but disability is generally prolonged through several months.

Numerous reports of tularemic pneumonia have appeared in the literature during the past five years. Some of these complications were found post mortem, while others were definitely diagnosed before death, where that occurred, or during the patient's illness or convalescence.

In 1931, Permar and MacLachlan reported finding consolidation, necrosis and thrombosis of the lungs at autopsy in a patient dying of tularemia with pulmonary symptoms. Sante reported a case in the same year in which the patient showed small consolidations in one lung; but with subsequent clearing and recovery. *Bacterium tularense* was recovered from the digital ulcer, and from the patient's blood.

Tureen, in 1932, reported another case. His patient had several small hemoptyses and developed pleural effusion, the fluid giving positive agglutination for *B. tularense* in high dilution. This patient also recovered, but disability persisted for more than three months.

In 1935, Kavanah gave an excellent report of a series of 123 cases of tularemia with pulmonary involvement in 16. Pleurisy and effusion occurred in three of these. There was a mortality rate of 25 per cent in the pulmonary cases, as compared with only four per cent for the entire series. Of those recovering, seven per cent were still 25 per cent incapacitated by fatigue and weakness at the end of a year.

Blackford reported 35 cases of tularemia in March of last year. Seven had a complicating pneumonia, and three of these died—a mortality of over 40 per cent as against 11.4 per cent for the series. Seven other patients of this group had bronchitis, and three had pleural effusion; so more than 48 per cent of his series had some complicating pleuro-pulmonary lesion.

The treatment of tularemic pneumonia, like that of the underlying bacteremia, is largely symptomatic and supportive. Foshay, of Cincinnati, has developed an anti-tularense serum which appears promising; but its use is still in the experimental stage.



Fig. 1. Made from an X-ray film of the chest taken on August 24, 1935. Shows extensive consolidation middle portion of right lung; slight infiltration middle portion of left lung.

Case Report

We encountered an interesting case of tularemic pneumonia at the Deerwood Sanatorium in the summer of 1935 in a man, aged 37, suspected of having pulmonary tuberculosis. The clinical history and observations were as follows:

On July 9, 1935, one of the local doctors called us by telephone stating that he had in his office a very sick man with a pleural effusion which he thought might be tuberculous, and for which he wished to have the patient admitted to the sanatorium at once. He added that the man also had tularemia. There was no bed available at the institution at the time; so the doctor was requested to put his patient to bed at home until such time as we could admit him to the sanatorium.

On August 24, about 1½ months later, the patient was seen in one of our monthly chest clinics. Physical examination revealed considerable pathology on the right, especially anteriorly; so we advised an X-ray examination. A film taken the same day showed an inflammatory area occupying roughly the middle half of the right lung-field, and there were finger-like shadows extending out from the left hilum into the left lung-field. While the appearance was atypical for tuberculosis, it was deemed advisable to admit the patient for a period of observation. The history obtained on admission and subsequently was as follows:

On June 16, he suddenly developed chills and sweating attacks. On the following day he felt feverish. Next day he consulted his doctor. Blood was taken

for laboratory tests. About two weeks later, the doctor tapped his right pleural space, and according to the patient, withdrew about a quart of fluid. The patient has but hazy recollections of what happened during an interval of two weeks or more, except that his fever continued and that he was very ill. There was some cough and expectoration, and both had continued to the date of his admission on August 31st. He had lost approximately 30 pounds in weight, but had already regained ten. There had been two small pulmonary hemorrhages. He was feeling much better at this time, but tired very easily and felt much weaker than before the onset of his illness. There was, in addition to the cough and expectoration, some pain in the right lower chest on inspiration. He was also somewhat dyspneic.

The temperature was but slightly elevated on admission, and the pulse rate was normal. Physical examination, aside from the chest findings, was essentially negative except for a very poor condition of the teeth and gums. Blood pressure was 122 systolic and 80 diastolic. The chest examination showed dullness and moderately coarse râles over the right middle two-third anteriorly, and similar abnormal sounds in the right interscapular area and in the right mid-axillary line near the base. The blood Wassermann test was negative. Agglutination for *B. tularensis* was present in a dilution of 1:1280 according to a report from the Minnesota Department of Health. Agglutination was absent for the typhoid and paratyphoid group, and also for *Br. melitensis*.

In order to rule out tuberculosis, several sputum specimens were examined for tubercle bacilli; but all were negative. A Mantoux test of 1/10 mg. of old tuberculin was made on September 5th. This was definitely negative. A second intra-dermal test with the second-strength solution of purified protein derivative was likewise negative. Another X-ray examination on September 9th, 16 days after the first film, showed considerable resolution on the right and also some on the left. These findings seemed fairly conclusive for the non-tuberculous nature of the patient's pulmonary pathology, and he was, therefore, discharged from the institution as a resolving tularemic pneumonia and instructed to return later for another X-ray check-up.

Before his discharge, a guinea pig had been inoculated with about two cubic centimeters of the patient's sputum. The animal died on the sixth day, and autopsy showed inoculation abscesses and inflammation in the groins and grayish, miliary lesions in the spleen. This organ and smears from the abscesses were sent to the State Department of Health for examination. The report showed that Gram-negative organisms "very suggestive of *B. tularensis*" were found in the smears. Dr. McDaniel had no hesitation in stating that the guinea pig had died of tularemia. We were also informed at this time that pleural fluid withdrawn by the family physician from this patient in July had resulted in the



Fig. 2. Made from an X-ray film of the chest taken on July 25, 1936. Shows fibrotic band across mid-field with retraction of heart and mediastinum to right. No evidence of cavity now.

death of an inoculated guinea pig, death being due to tularemia.

We saw our patient again in November of the same year, approximately five months after the onset of his illness. An X-ray examination at this time showed the lesion on the right reduced to about one-third its original size, but very dense and giving the suggestion of beginning cavity formation. The left side appeared to be practically clear. The blood showed an agglutination titer of 1:640. The Mantoux test was repeated and found negative. The patient still tired easily, and there was some cough; but he had had no further hemoptyses.

On April 9, 1936, we X-rayed him again. This was nearly ten months after the onset of his trouble. There was now a fibrotic area approximately an inch wide extending across the right midfield with what appeared like a definite cavity $\frac{3}{4}$ by $1\frac{1}{4}$ inches in diameter just below it. The agglutination titer was again reported positive in a dilution of 1:640. The patient was feeling fairly good and working every day, but he still tired more than before his illness.

In July, 1936, we saw him again. He still admitted tiring more readily, and stated that he coughed a little but did not raise anything. His X-ray film at this time showed again the fibrosis in the right midfield but no definite evidence of a cavity. Another Mantoux test was reported negative. A final film was made on September 5th, 1936, a little more than a year after the first X-ray examination, and nearly 15 months after the acute onset of his illness in June, 1935. This film showed approximately the same findings as the previous one.

The agglutination titre at this time was atypical in a dilution of 1:160.

Comment

We report this case because of the problem in diagnosis which the patient presented when he first consulted a doctor. It seems remarkable to us that more than two months after the acute onset of his tularemia, the patient's chest still showed so much pathology. Our patient evidently had the typhoid type of tularemia, as no primary sore was ever found, so far as we could ascertain, and no enlargement of lymph nodes appears to have occurred. There was some contact with rabbits about two weeks or more before the onset. This seems to be too long an incubation period, as the average is approximately three days. He did, however, pick off a great many wood-ticks from his body a few days before he became ill; so it appears more likely that his infection was contracted through a tick-bite. It would seem important to have tularemia always in mind when attempting a diagnosis in any acute or subacute pulmonary condition presenting itself to the physician.

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Theobromine Calcium Gluconate

In the Treatment of Cardiovascular Disease

Thomas Ziskin, M.D.

Minneapolis, Minn.

THE maintenance of an effective coronary circulation is the prime requisite in the treatment of cardiovascular disease. Various drugs have been used for this purpose. The nitrites and iodides were in favor in the early part of the century; however, because of their temporary action their use was greatly restricted. In the past decade the xanthine derivatives, which previously had been used mainly for their diuretic action, came into general use in the treatment of cardiovascular disorders, particularly because of their sustained vasodilator action. It was found also that they relieved the pain of angina pectoris and were helpful in cardiac asthma.

Smith, Miller and Graber studied the effect of the xanthine derivatives experimentally by perfusion experiments on the isolated heart of the rabbit and measured the increase in the coronary flow as a result of the use of the various compounds. Recently, Smith, Rathe and Paul have reported on their clinical experience in the use of theophylline and theophylline derivatives in the treatment of coronary artery disease, manifested by congestive failure, paroxysmal dyspnea, angina on effort or coronary artery occlusion. They summed up their results over a period of eight years and conclude that these drugs are valuable therapeutic agents in the treatment of these conditions.

Theobromine was the first of the xanthine derivative to be used in the treatment of coronary artery disease Askanazy having recommended it in 1895 for cases of angina pectoris and cardiac asthma. Theophylline derivatives have been used extensively during the past decade. Theophylline, however, is not readily soluble in water and its maximum therapeutic effects have been delayed because of its slow and incomplete absorption from the gastro-intestinal tract. The combination of theophylline with ethylene diamine (aminophyllin) is much more soluble and more readily absorbed and its action, therefore, is more prompt and more intense than theophylline. Continued use of theophylline ethylene diamine, however, may also cause gastric irritation and in clinical cases it becomes necessary to discontinue its use when symptoms of gastric irritation occur or to alternate its use with some other xanthine derivative which is less irritating to the stomach.

Comparative clinical studies on the effectiveness of various drugs of the xanthine series have appeared in the literature from time to time. Smith, Miller and Graber as a result of their perfusion experiments on the isolated and intact heart of the rabbit, believe that theophylline ethylene diamine has a more pronounced effect on the coronary circulation than the other xanthine derivative. On the other hand, Gilbert and Fenn using the intra-

animal found that theobromine and its salts was more effective in increasing the coronary flow. Gilbert and Kerr in a study of eighty-six ambulatory patients with angina pectoris, who were allowed to continue their regular activities, made observations on the effect of preparations of theobromine, theophylline and theophylline ethylene diamine. They found that, clinically, the theobromine preparations were also more effective than aminophyllin in the treatment of angina pectoris.

Recent studies on methods of overcoming gastric irritation caused by certain drugs have been made by Schnedorf, Bradley and Ivy. By means of Pavlov stomach pouches they observed the effects of prolonged administration of acetyl salicylic acid and noted a definite increase in the gastric secretion. With the addition of calcium gluconate the increase was not nearly so marked and with sodium bicarbonate there was a decrease in the gastric secretion. They believe that the neutralizing and inhibiting action of calcium gluconate and sodium bicarbonate on the titrable acidity of the gastric contents and on the output of hydrochloric acid may play a definite rôle in the ameliorating effects of the substances upon the degree of gastric irritation and the incidence of ulceration produced by the prolonged oral administration of acetyl salicylic acid and other drugs. While the protective action of sodium bicarbonate may be adequately explained by a reduction of acid irritation, this is not true, they say, of calcium gluconate whose protective action against digestive disturbances appears to be due also in part to some systemic action of calcium.

Because of the known tendency of theophylline preparations to cause gastric irritation as a result of their prolonged use in cardiovascular disease, a study was made of the effects of a preparation of theobromine calcium gluconate. Fifty-two cases were studied. Among these were twelve cases of hypertension, eleven cases of hypertension with cardiac decompensation, seventeen cases of coronary disease with angina pectoris and twelve cases of coronary disease with cardiac decompensation. Thirty-two were bed patients and twenty were ambulant. Many of these patients had been taking theophylline ethylene diamine (aminophyllin) before being started on theobromine calcium gluconate. Other drugs such as digitalis, were used in conjunction with these preparations whenever necessary. Theobromine calcium gluconate was given in five grain doses three times daily. This dose was later increased in some patients to ten grains three times daily. There was not a single instance of nausea or gastric irritation in any patient from the use of this preparation. Some of the patients have been

taking this drug continuously now for a period of nine months. Two patients, who were receiving aminophyllin and developed nausea and gastric distress, were completely relieved of their gastric symptoms when changed to theobromine calcium gluconate. Favorable results were noted in the majority of these cases in relieving symptoms of congestive failure, angina and dyspnea and in some cases the results were very striking. Digitalis was used in conjunction with theobromine calcium gluconate in the cases with congestive failure.

In comparing the effects of aminophyllin with theobromine calcium gluconate on the relief of cardiac symptoms more favorable results were noted with the use of theobromine calcium gluconate. Eight, of the fifty-two patients, reported greater relief of pain when taking theobromine calcium gluconate. Twelve patients, who were taking the theobromine preparation and then changed to aminophyllin, asked to be put back on theobromine calcium gluconate stating that they received greater relief of their symptoms when taking this preparation.

No cases of occlusive vascular disease of the extremities were included in this series, but the use of theobromine preparations in these conditions has been definitely established and many observers have reported very favorable results.

Conclusions

Theobromine calcium gluconate is a valuable preparation in the treatment of cardio-vascular disease.

It may be prescribed over long periods of time without causing any gastric distress. It is preferable to theophylline ethylene diamine (aminophyllin) for this reason.

In a series of fifty-two cases of heart disease it was found to be more effective in relieving symptoms than theophylline ethylene diamine (aminophyllin).

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Eyeground Examination As An Aid to Prognosis In General Medicine*

M. F. Fellows, M. D.

Duluth, Minn.

THE purpose of this paper is not to advance any new or startling discoveries, but to serve as a reminder of one means of examination which should always be included in any complete examination. It is one which is omitted perhaps more frequently than any other. There are many times when examination with the ophthalmoscope will yield as much information as, if not more than, the sphygmomanometer or the test-tube. Too often, the eye is thought of as only a small organ of the body, separate, unaffected by the diseases which affect the more distant organs, and it is forgotten that diseases of the ocular fundus are, as a rule, merely symptoms of diseases originating elsewhere. It is forgotten that the retina and underlying choroid are highly vascular tissues and that many disturbances of the general organism may be noticed there before the disease has progressed far enough to produce noticeable pathology in the less delicate tissues of the body.

Often, the dramatic choking of the discs found associated with brain tumor is remembered when the retinal lesions of general bacterial infections, of blood diseases, syphilis, tuberculosis and the many other more frequent and just as important findings are forgotten and not looked for. Too often, the warning signs flaunted in the retina in the development of arterio-sclerosis, of hypertensive disease, of Bright's disease, of diabetes, and the toxemias of pregnancy are not looked for, and perhaps, no importance is attached to their presence. If their presence is recognized, it is frequently passed off as just another symptom of the disease present and no prognostic importance is attached thereto, thus overlooking the fact that inasmuch as the condition of the blood vessels of the retina and choroid is pictured for whoever may observe it, in almost the same degree is the condition of the blood vessels of the kidneys and other vital organs of the body so pictured.

In this discussion it will be necessary to limit remarks to one or two conditions and in these, it will only be permitted to touch on the most salient points, omitting any detailed discussion of the pathology. The prognostic importance of retinal lesions in kidney diseases and in toxemias of pregnancy will be discussed in the hope that such discussion may stir up enough interest that whoever may be interested will, of his own accord, carry the study further.

Albuminuric retinitis, as is called, the retinopathy associated with Bright's disease, occurs in all forms of chronic nephritis, but is particularly common in the primary interstitial type.

The retinal changes which may be found in a case of albuminuric retinitis may include some or all of the following: (1) *Optic neuritis* and retinal edema, which are shown by a blurring and indistinctness of the disc margins, usually noticeable first on the upper and lower margins, and next on the nasal side, the temporal border being the last affected. The retinal edema may extend from two to four disc diameters from the disc margins. (2) *Hemorrhages* which may be either striate or punctate in character, and are usually situated in the nerve-fibre layer of the retina. (3) *Exudates* ("cotton-wool patches"), which are irregular in size and shape. (4) *Small white spots* may be found in the macular region. These are situated in the deeper layers of the retina and are more frequent than the so-called (5) "Star-figure" in the macula which is due to fatty deposits along the fibres of the retina. (6) The *blood vessels* may show increased white stripes along the course of the arteries. The veins may appear distended while the arteries seem underfilled. (7) The blurring of the optic neuritis may become so marked as to simulate a *choked disc*, especially when there is an associated edema of the optic nerve. (8) *Detachment of the retina* may occur in the more advanced stages of the disease.

The more gross of these findings may be noted by anyone who is familiar with the use of the ophthalmoscope, and does not require the acumen which is necessary to detect the more border-line changes. In the acute glomerular nephritis with generalized edema, that of the retina, according to Wilmer, is the last to disappear, and may be used to indicate complete recovery, while, on the other hand, if the condition should progress to the nephrotic stage, the edema may be seen to increase. In retinitis from an acute toxic nephritis, such as those accompanying scarlet fever and pregnancy, when there is not an underlying chronic nephritis, the prognosis is considerably better than in the cases associated with the more chronic condition.

As regards the importance of these changes, Maitland states, "In the cases in which signs of vascular degeneration predominate, the prognosis is always grave, because the morbid changes in the blood vessels are steadily progressive, not only in the arteries of the retina, but also in those of the brain, the kidney, and other parts of the body—general arteriocapillary fibrosis. On the other hand, where the signs of acute toxemia predominate, a favorable prognosis may be given wherever it is possible to remove the cause of the toxemia."

Fox has said, "The relationship between kidney disease and retinitis is not well understood, but the cause of the ocular disturbance is probably an extension of the degenerative changes in the vascular system to the

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small vessels in the tunics of the eyes. The severity of the eyeground symptoms seems to bear no fixed relation to the intensity of the renal disease, as the kidney affection may complete its course without any attention being directed toward the eyes. On the other hand, while the retinitis is not an early occurrence in nephritis, it may be the first recognized, and its importance in this connection is very great."

The presence of hypertension and arteriosclerosis increases the complexity of the retinal picture as well as the severity of the general condition. Both hypertension and arteriosclerosis may be considered from the standpoint of each, but there is not time for their consideration here.

Various authorities have given us fairly definite figures regarding prognosis as to life associated with albuminuric retinitis, and it is well worth while noting these figures and observing how nearly they correspond with each other. Fuchs stated, "Patients suffering with typical albuminuric retinitis succumb from their renal disorder within one or two years." Vannady and O'Hare state, "An advanced retinopathy in chronic glomerular nephritis usually indicates death within seven months." Adam gives the probable length of life after the onset of an albuminuric retinitis as from two to three years in 90 per cent of the cases. In one group of 38 patients observed by him, 29 died within one year, four died from one to two years, and two died in from two to four years. Three patients observed with the retinitis of pregnancy recovered.

Ball states, "Probably 85 per cent of all patients with albuminuric retinitis die within two years. A few live for three, four, five, or six years, and exceptional cases have survived for ten or 12 years." Fox makes the statement, "Albuminuric retinitis is of diagnostic importance—and usually indicates a fatal termination in from six months to two years unless prompt treatment is instituted." Terrien and Renard say, "In general, the

kidney lesions parallel the ocular lesions, so that the prognostic value of renal retinitis is great. One may expect a severe renal disturbance within a short period, if one discovers renal retinitis in a person who is, at the time, in apparently good health." It will be noted that the average of these predictions is about 23 months following the onset of an albuminuric retinitis.

Pregnancy is frequently a grave complication in a patient with a chronic nephritis, and any clinical means of checking the amount of damage present is of extreme value. Pregnancy increases the load on the entire vascular system of the mother, and its effect may be noticed ophthalmoscopically as the retinal vessels reflect the damage to the smaller blood vessels throughout the body.

The prognosis in the acute toxemias of pregnancy which produce retinitis is usually good, provided there is no underlying chronic nephritis. Adam states, "The albuminuria of eclampsia can give rise to an albuminuric retinitis, only when it persists after delivery." Manes remarks, "The albuminuric type of retinitis, retinal foci coincident with nephritis, small retinal hemorrhages, or white spots around the disc during pregnancy constitute a double jeopardy, *i. e.*, to both vision and life."

Adam, DeSchweinitz, Peter, all agree that retinitis developing from an exacerbation of a chronic nephritis is an absolute indication for the termination of the pregnancy in order to prolong the life of the mother. Zentmayer's arbitrary rule is frequently referred to, namely: If retinitis develops before the sixth month, the pregnancy should be terminated. If at the eighth month, carry patient to full term. Between the sixth and the eighth months, be guided by the visual disturbances. If the vision is poor, terminate pregnancy.

This discussion has been, of necessity, brief, but it is hoped that it may in some way lead to more interest in the inclusion of fundus examination as a means of determining the course and prognosis of the ordinary conduct of clinical cases in daily practice.

Acute Abdominal Symptoms Complicating Diagnosis*

With Case Reports

J. L. McLeod, M.D.**

Grand Rapids, Minn.

IN ANY discussion of the differential diagnosis of the acute abdomen, one always hears of many conditions confined to the abdomen itself which confound the practitioner and make accurate diagnosis difficult. One need only mention stone in the ureter, Dietl's crisis, perforated duodenal ulcer, pyelitis, salpingitis, mesenteric adenitis, ectopic pregnancy, and ovarian cysts to call to mind a few of the conditions which make the

diagnosis by the surgeon anything but an open book. This paper presents to you briefly four case reports (one borrowed from Drs. Binet and Engdahl, also of Grand Rapids) which illustrate the fact that general pathological conditions may, in the early stages, so simulate the acute abdomen that one must use extreme care not immediately to classify a case with acute abdominal symptoms as an acute appendix or some other form of acute abdomen.

Case I: A. T., male, age 19 years, was admitted to

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**The Itasca Clinic.

the hospital June 15, 1935, stating that he had felt well until the night before, when he got a sudden pain in the epigastrium. This pain, in a few hours, localized in the right lower quadrant and nausea was present. He reported to the CCC doctor, who transferred him to our hospital. On admission, his complaints were as stated except that cramp-like pain was also present in the left leg and radiated up the left side to the left arm.

On physical examination, the skin showed some splotches almost like freckles in color, but larger, appearing on arms and legs; external examination was otherwise normal. Blood pressure was 120/80. The heart was normal. General condition negative. The abdomen showed some rigidity in the right lower quadrant, fairly marked tenderness and rebound tenderness. Rectal examination demonstrated tenderness in the right lower quadrant.

Laboratory tests showed a white blood cell count of 12,200, red blood cells 4,100,000, hemoglobin 81 per cent, urine negative.

The diagnosis was acute appendicitis. The appendix was removed at once under spinal anaesthesia. Gross inspection showed some distention of appendix. There was no injection. The pathological report was acute catarrhal appendicitis.

It would seem that the case was clear-cut and surgery should have closed the story, but on returning from the operating room, the boy started to vomit, and a few hours later vomited red blood. On the following day, the patient commenced passing blood by bowel in fairly large amounts; the skin demonstrated a shower of erythematous patches; the hemoglobin dropped from 81 to 76 per cent, the red blood cells from 4,100,000 to 3,720,000, the white blood cells from 12,000 to 8,000. On the third day, more blood was passed; on the fourth day, he not only passed blood, but again vomited it. Careful questioning at this time revealed that the boy had really been sick on the twelfth, three days before admission. He had reported this and had shown the erythematous patches, but these had not been taken seriously by either patient or physician and were not reported on admission. When no improvement was noted on the fifth postoperative day, the platelet count was found to have fallen to 78,000, the red blood cells to 3,000,000 and the hemoglobin to 70 per cent, decision was made to use whole blood in small amounts both intravenously and intramuscularly. Blood from a suitable donor was given. The procedure was repeated June 20th, 21st and 22nd. On the twenty-third, the patient was markedly better. He passed formed stools with very little blood on the twenty-fourth. Platelet count was 90,000 and his condition steadily improved. He was discharged on June 27th, with a final diagnosis of erythema multiforme with slight appendiceal involvement.

In discussing this case, one feels that there was an error in not going into more detail obtaining the initial history and in not delaying the surgery till some study had been made of the possibility of a systemic disease with abdominal symptoms. Chenowith, in *Medical News*,

March 4, 1905, states, "The matter of diagnosis is one of grave importance. The attack of colic, the so-called abdominal crisis of exudative erythema, may easily lead the inexperienced to make a diagnosis of appendicitis when no such lesion exists; on the other hand, a more serious mistake may be made of overlooking the co-existing appendix trouble, unless it is recognized that these vasomotor circulatory disturbances do, at times, result in congestion of, and even hemorrhage into, the appendix with the result that there may be bacterial infection and inflammation or actual gangrene of this organ." The literature reports many cases where the abdominal symptoms are present. In this particular instance, inasmuch as our pathologist reported acute catarrhal appendicitis, there is room for argument as to whether we might not have left the appendix *in situ* and given our patient a better chance at recovery. The fact that the case ended happily for all concerned does not, however, excuse us for not giving careful thought to the necessity of ample study pre-operatively. It is to impress the need of always remembering rare possibilities and also the need of thorough investigation that this case is presented.

Case II: J. N., male, age 11 years, was admitted to the hospital May 25, 1936. The patient stated that he was well until May 22, 1936, when, at school, he noticed pain in the lower abdomen with nausea and vomiting. He went to bed at home, but was quite sick all night. The next morning he could not stand or walk because of pain in the lower abdomen and upper thighs. This was much worse on the right side and the child presented the slightly flexed thigh frequently seen in acute appendix. Not improving during the day, he was brought to the hospital and was first seen at night.

Physical examination showed temperature 100.6°, pulse rate 112, respiratory rate 20. Head was normal. Tonsils were moderately enlarged and inflamed. The neck showed a little rigidity. Cervical adenopathy was present. Both lungs were clear. The heart was normal. The abdomen revealed tenderness in region of the navel, rebound tenderness in McBurney area, marked rigidity at times over the whole abdomen. This was absent at other times.

Laboratory work showed a hemoglobin of 87 per cent red blood cells 4,530,000, white blood cells 30,200, urine negative.

Because of neck rigidity, lumbar puncture was done. The fluid was clear, under normal pressure, with a normal cell count, reported normal from the state laboratories later. Agglutination tests were later reported negative from the state laboratories. An ice bag was placed on the abdomen and the child was observed 24 hours. At that time white blood cells numbered 20,000. The abdomen remained painful and the right leg drawn up slightly. Tenderness and rigidity of the right lower quadrant were still present but no mass was apparent. The pain in the abdomen was bad enough at times to require a little morphine, and at this time we started using some salicylates. At intervals during the next 24 hours, the

boy would cry and complain to the nurses of his severe abdominal pains and cramps. Enemas were used and gave some relief. However, six days after the first symptoms and three days after admission to the hospital, some joints in the left hand started swelling and became painful. On the 29th, white cells numbered 17,200, and the patient, for economic reasons, was discharged for further observation and treatment at home. Blood smears at this time suggested a possible commencing myelogenous leukemia.

The patient was again seen one week later after absolute bed rest and salicylates. He was much improved and able to walk without limping. His joints were neither sore nor deformed. Pain in the abdomen was all gone and he was eating fairly well. A marked cardiac murmur had not been present previously but was now apparent. After five weeks of observation with rest and salicylates, the boy showed very marked improvement, the cardiac murmur almost disappeared and the patient was discharged with a diagnosis of acute rheumatic fever.

In this case, on superficial examination, the diagnosis of acute abdomen could readily have been made. The pain, nausea, vomiting, rigidity and tenderness were all present. The flexed thigh, the somewhat elevated temperature and even the blood count, which, while high enough to be typical of an acute rheumatic fever, was not out of keeping with that found in a ruptured appendix, and, seen as they were on the third day of symptoms, would have made surgical intervention excusable.

Case III: A white male, age 21 years, according to his first history, had previously been perfectly well. He ate a large Sunday dinner at the CCC camp of which he was a member, and in the afternoon, went to a ball game. During the game, he was suddenly seized with sharp colicky pains in the lower abdomen accompanied by nausea. He got out of the stand and over to the edge of the grounds and vomited. The camp surgeon was called immediately and saw him about one-half hour later. Upon examination, he found distinct, localized pain and rigidity in the right lower quadrant. The patient was transported to the hospital at once and admitted at 5 p. m. His general physical examination and appearance were essentially negative except that he had the same abdominal findings as determined by the camp surgeon. However, his temperature was then 104.6°, pulse rate 108, respiratory rate 32, and the leucocyte count 6,100, suggesting some condition other than the apparent appendicitis. It was decided to observe the patient a little longer. By eight p. m., the temperature had fallen to 99.8°, the acute pain had subsided, the white blood cell count was 5,100, but there was still some tenderness in the abdomen. The next morning, the temperature was 98 and the patient had no complaints. He had slept soundly throughout the night. At three p. m. the patient had a severe chill lasting 35 minutes, followed by a temperature of 102° and severe pain in the abdomen. Then, further details of his history were brought out. He had arrived at Fort Snelling about one week

previously with a contingent from his home in Topeka. The first few days he had had a headache and the third day some abdominal pain; he was given some pills but they were not retained. He thought he was upset due to the cold lunches and candy he had eaten on the journey. Toward the end of the week, he felt quite well and was sent out with the contingent for this area, arriving the day before his present illness. Further questioning revealed that about a month before leaving home he had experienced chills. Acting on the new facts brought out and the presence of chills, a blood smear was then obtained. Fresh, unstained blood revealed small round, ring-like and irregular bodies within the red cells, many of them showing a vibratory motion. Wright-stained smears showed many small bluish granules within the red cells as well as extra-cellularly. These findings were thought to be conclusive enough to warrant a diagnosis of malaria and quinine therapy was instituted with prompt relief of symptoms.

The interesting point was that malaria would evidence these symptoms. However, it is known that this disease presents a large variety of forms and may at times closely simulate all other known diseases. For instance, there may be malarial pneumonia, meningitis, pleurisy, neuralgias, rheumatism, otitis media, coryza, stomach disorders resembling ulcer, appendicitis, diarrhea, typhoid, disturbances of vision, pseudo-angina pectoris, heart murmurs, hepatitis suggesting gallstones, pyelitis, cystitis, extensive furunculosis and skin eruptions.

As a slight digression here, a warning to all practitioners should be given that because of rapid transportation in closed cars and trailers, malaria is carried north by the *Anopheles* mosquito and it may affect native Minnesotans. Furthermore, the swift travel of people from one section of the country to another makes it necessary to add this southern disease to the northern medical worries.

Case IV: D. K., female, age 15 years, was first seen at home, April 16th, because of severe, colicky, lower, left, abdominal pain which had come on suddenly. The pain was so severe the patient lay in bed crying. She was nauseated, but had not vomited. The abdomen was rigid over the lower left quadrant. The general examination was negative as was the past history except for two previous attacks of chorea. The heart was normal, pulse rate 100, respirations 22, temperature 102°, hemoglobin 85 per cent, white blood cells 5,100.

An ice bag was applied and the patient put under observation. Her temperature varied a little. There was some constipation relieved by enemas, but still the pain and rigidity continued. Ectopic pregnancy, salpingitis, and ovarian cyst were clearly in the picture but the history was against the former, and negative vaginal smears ruled out the second. Watchful waiting was continued and at the end of a week, the abdominal pain had disappeared slowly. The girl commenced having an afternoon temperature up to 103° at three or four p. m., returning to normal about nine p. m. All agglutination

tests were ordered and were sent April 23rd, May 3rd, May 4th, and May 13th. They all came back negative. In spite of the negative tests, the presence of all the symptoms of undulant fever led us to make such a diagnosis and to avoid operative interference.

Simpson says in this connection, "Abdominal pain is a prominent complaint in about 12 per cent of cases of undulant fever. This is common early in the course of the disease. The pain may be generalized or confined to any one of the abdominal quadrants. There are many instances on record of needless and perhaps harmful surgical intervention in cases of undulant fever in which the abdominal symptoms were a prominent feature of the disease."

The negative agglutination was investigated and it was found that cases are on record in which such a state of affairs existed. A year before the family had a cow which "dropped" two calves, was tested and found to have Bang's disease, and then was disposed of. No other contact was proven. Acting on this diagnosis, we obtained Brucella serum and administered it. The

patient continued to grow worse, but presented every symptom typical of undulant fever throughout her illness. It was not until May 20th, more than a month after the onset of the disease, that she developed a cardiac murmur and the diagnosis was changed to sub-acute bacterial endocarditis. Some blood was plated, and sent to the laboratory to try to culture some germs, but the laboratory reported no growth. Also, on the 23rd, petechiae first appeared, and, on the 27th, in spite of heroic treatment, the girl passed away. This case was interesting from many angles, but principally to stress again the variety of general diseases which present localized abdominal symptoms early in their course.

No effort is made in this paper to present any new or revolutionary medical discoveries. It is presented in the hope that it will again emphasize the multiple pitfalls the general practitioner faces in making speedy, correct diagnoses. Such knowledge will, it is hoped, call forth even more careful diagnostic practice in Minnesota.

Artificial Pneumothorax* A Standard Method of Treatment

J. Arthur Myers, M.D.**
Minneapolis, Minn.

and

Ida Levine, M.D.
Brooklyn, New York

COLLAPSE therapy has been accorded a prominent place in the diagnosis and treatment of some pulmonary, bronchial and pleural diseases during the past two or three decades¹. The chief methods employed in lung collapse are artificial pneumothorax, interruption of the phrenic nerve and extrapleural thoracoplasty. Of these, the most simple, the most effective, and certainly the most widely used is artificial pneumothorax.

Formerly we looked upon artificial pneumothorax as a drastic procedure, and one that should be employed only as a last resort. However, it has come to be recognized as a simple procedure which has passed the experimental stage and is now looked upon as a standard method of treatment. Peters² says: "Artificial pneumothorax is the most efficient of all forms of compression when a good collapse is possible." Amberson³ is of the opinion that when it collapses the lung adequately and is continued long enough, it restores a majority of the patients selected who otherwise would be destined for an early death or at best permanent disability. Slyfield⁴ says: "This one treatment often makes a difference between life and death." The time has arrived when in

conjunction with our modern methods of diagnosis its use should be greatly extended.

Several different apparatuses have been devised for the administration of artificial pneumothorax. It makes no difference which of them is used as long as it delivers the gas or air into the pleural cavity at the desired rate and under manometer reading control. Those which deliver air under low pressure are in common use in this country. However, some Italian clinicians find it more satisfactory to use a simple apparatus which filters the air and allows it to be sucked into the pleural cavity by the negative intrathoracic pressure. This procedure obviates the danger of acute pneumothorax to which Yates⁵ has called attention.

There was formerly a great deal of discussion as to the kind of gas to be introduced into the pleural cavity. Some clung to the view that carbon dioxide should be used for the initial treatment, since in case of gas embolus this would be very quickly absorbed. Others preferred the use of oxygen for the initial treatment for the same reason, although oxygen in the blood stream is not absorbed as fast as carbon dioxide. Neither of these gases is satisfactory for the subsequent refills because they are absorbed from the pleural cavity too rapidly. For the refills, nitrogen was thought to be best by many because of its slow absorption rate so that the interval between treatments could be long. Observation has

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**From the Departments of Internal Medicine and Preventive Medicine, University of Minnesota, and the Lymanhurst Health Center, Minneapolis.

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shown, however, that ordinary air is adequate, although it absorbs a little faster than nitrogen because of its oxygen content, still it is retained in the pleural cavity for a sufficient length of time. Most physicians use ordinary air for the initial treatment also. Berlin⁶ and Montenegro⁷ are of the opinion that cold gas or air is irritating to the pleura and, therefore, causes pleural effusion. They recommend the warming of air either by the use of a special apparatus or by placing the tube, through which the air passes, in hot water. However, we have always administered air at room temperature, which has proved entirely satisfactory.

Neumann⁸ believes that 400 to 600 cc. is not too much air to introduce on the initial treatment. However, 200 to 300 cc. is usually recommended, since with this amount there is less likelihood of tearing adhesions and slow collapse of the lung is more desirable. The frequency of refills depends very much upon the individual patient: one will absorb air from the pleural cavity rapidly and another slowly. The more common practice in this country consists of administering the first refill of 200 to 300 cc. approximately forty-eight hours after the initial treatment. The second, in three or four days, and the third approximately a week later. The amount of air introduced on each of these refills must depend upon the manometer readings and the physician's judgment. It is best to discontinue while the intrathoracic pressure is negative. Patients are usually kept on a week schedule for some time, after which the intervals are lengthened depending upon the rate of absorption in the individual case. Fluoroscopic or X-ray film control is very desirable at the time of each refill, particularly when one is considering the lengthening of the interval between treatments.

Passing a needle through the chest wall, whether for the purpose of introducing air or aspirating fluid, is attended by some danger, which together with the various complications attending artificial pneumothorax treatment, has been discussed elsewhere^{9,10}.

Because of so much reserve pulmonary tissue, the greater part of each lung may be destroyed, and yet, if the disease can be brought under control, the patient lives. When bilateral pneumothorax is being considered, the vital lung capacity of the patient is of considerable importance. Frisch¹¹ is of the opinion that bilateral artificial pneumothorax is contraindicated if the vital capacity is materially reduced. We have used vital capacity determinations rather extensively in artificial pneumothorax cases both before and after treatments¹² and have never seen any harm result from the tests but have often received valuable aid in the guidance of subsequent treatments. Studies on the effects of artificial pneumothorax on vital capacity have shown that the reduction is not consistent with the amount of air introduced into the pleural cavity. Liebermeister¹³, Frisch and others¹⁴ found the vital capacity is reduced much less than one would expect from the amount of air introduced into the pleural cavity, that is, the decrease

in the vital capacity is less than the amount of air introduced.

Dumarest and Delong¹⁵ showed that the respiratory capacity falls rapidly following the collapse of a lung, in fact, it may equal only one-fourth of the total capacity before pneumothorax. As the collapse continues, compensation is established, and the respiratory capacity gradually returns to the normal. Means and Balboni¹⁶ have found that all the factors of respiration, gaseous exchange, carbon dioxide tension, and the mechanical factors are normal in persons with a collapsed lung.

Basal metabolic rate usually is not altered by artificial pneumothorax except in cases who have an elevated metabolism as a result of tuberculosis before the pneumothorax is instituted. In such cases, the metabolic rate is reduced to normal if the pulmonary lesion is brought under control by artificial pneumothorax.

Paradoxical as it may seem, when the patient is short of breath from disease in one lung, collapse of that lung frequently improves breathing. In fact, the shortness of breath may completely disappear. Coley¹⁷ and others are of the opinion that dyspnea in such cases is not mainly mechanical but is largely due to toxemia.

Following the institution of artificial pneumothorax, some patients lose weight while others remain stationary or gain. Loss of weight may be due to lesions elsewhere in the body such as those of the gastro-intestinal tract, but often there is no obvious reason for the weight loss. However, Burrell and Garden¹⁸ believe that such loss in weight may be explained on the basis of diminished oxygen concentration of the blood which apparently causes an inefficient combustion of carbohydrates and fats. As the treatment continues, however, the uncollapsed lung accommodates itself to the altered conditions and the patient's body weight begins to increase.

Febrile reactions sometimes occur following the first few artificial pneumothorax treatments. They were seen more often when larger amounts of air were introduced on the initial treatment and with the first few refills. In such cases, it is believed that more rapid absorption of toxins immediately after the refills, explains at least part of the reactions. We have never found it necessary to discontinue artificial pneumothorax because of such reactions, since smaller amounts of air at more frequent intervals have been sufficient in our cases.

Some changes occur in the blood and the circulatory system when artificial pneumothorax is begun but they are harmless and some are definitely beneficial. Ricci¹⁹ has called attention to the fact that the anoxemia which occurs is due to compression of superficial alveoli. He finds that for about an hour after the refill the blood sugar is raised and that the anoxemia disappears through a compensatory increase in the erythrocytes. There is a temporary acidosis which decreases the alveolar carbon dioxide tension, but this quickly disappears when small amounts of air are introduced. When a collapse is performed too suddenly or too extensively, such changes are more marked. Hirschsohn and Maendl²⁰ found that the pulmonary circulatory rate can be normal in pneu-

mothorax but that it depends upon the condition of the heart muscle and the compensatory action of the lung function. Bosviel²¹ observed that the heart usually tolerates artificial pneumothorax remarkably well and that in most cases there is no change of the venous or the arterial pressure. This is also true when the pneumothorax is bilateral. He strongly advocates taking the venous pressure in each case, however, since this pressure reveals evidence of cardiac disturbance more clearly than the arterial pressure and therefore, provides valuable data concerning the heart's ability to support lung collapse.

Weiss²² found that in the collapsed lungs of dogs and rabbits, the circulation is lowered by as much as 12 per cent. In dogs with closed pneumothoraces, the amount of blood passing through the collapsed lung was approximately 70 per cent of the normal.

Perrin and Drouet²³ made studies on pneumothorax cases which showed that the electrocardiogram may be modified due to displacement of the heart, but that this is purely a physiologic modification and should never be mistaken for evidence of myocardial degeneration. Bronfin, Simon and Black²⁴ reported the results of an electrocardiographic study of one hundred and ten cases treated by artificial pneumothorax. They found the right ventricle often develops varying degrees of hypertrophy and are of the opinion that the electrocardiogram is a valuable aid in prognosis. Hansen and King²⁵ studied sixty-six patients who had undergone collapse procedures including pneumothorax, phrenic exeresis, and thoracoplasty. They state that the evidence obtained suggested that the heart changes are due to alterations in position influenced more by pleural and mediastinal adhesions than by myocardial factors. Later Hansen and Maley²⁶ reached a similar conclusion in electrocardiographic studies of fifty-seven patients who had been treated by thoracoplasty.

Gutstein²⁷ called attention to the increase in the number of red cells and hemoglobin percentage in favorable pneumothorax cases and to a decrease in the total white count, although the lymphocytes and eosinophiles were increased. Pescatori²⁸ made an experimental study of eosinophilia to determine whether in pneumothorax cases it is to be ascribed to an asphyctic state. He came to the conclusion that pneumothorax reduces the volume of the bronchial tree which follows or precedes the contraction of the elastic network of the lung. He ascribes the histo-eosinophilia and the eosinophilia of the blood in pneumothorax cases to this spastic state as well as the asphyxia. Michels²⁹ found an increase in eosinophiles in four of seven pneumothorax patients who improved. In cases without improvement, there was no increase in eosinophiles. Therefore, he attributes the increase to autotuberculin action.

That part of the lung which is diseased collapses more readily than the normal part, for example, when an area of disease is present in the apex and pleural adhesions are absent, the introduction of air into the pleural cavity results in a greater collapse of the apical portion of the

lung. Dumarest³⁰ and others have called attention to the fact that the elasticity of distention diminishes with the volume of the alveoli peripheral to the hilum. Therefore, it is easier to immobilize the apex than the base. It is also easier to immobilize infiltrated parts because their retractile capacity is increased. Healthy lung tissue has a tendency to expand with inspiration because of the counter pressure of alveolar air due to interference with expiration by the pressure of the surrounding pneumothorax, therefore, selective collapse is possible. Barlow has called attention to the fact that in the part of the lung involved with tuberculosis, there is marked impairment of expansibility while there is little or no diminution in contractility. However, the tendency to contract is compensated by an increased tension of the adjacent healthy lung in its attempt to conform to the shape of the thoracic cavity, but when one introduces a small amount of air into a free pleural cavity the total volume of the lung is reduced with the consequent reduction in tension, therefore, the lung is free to assume any form. Thus, selective collapse occurs by localization of air over the retracted pleura of the diseased areas, and a small amount of air may cause effective collapse of lesions scattered through an entire lung.

Partially because of selective collapse, artificial pneumothorax has been found a valuable diagnostic procedure, especially in diseases of the mediastinum, pleura, lungs, ribs, and chest wall when obscure conditions exist. It has been used to determine definitely whether intralobar empyema exists, whether true cavity is present in the lung, and the mapping out of other pulmonary conditions. When combined with lipiodol, it becomes unusually valuable. This subject has been discussed by such workers as Singer³¹, Fishberg³², Vallardi³³, Isaacs³⁴, and Sergent and Bordet³⁵.

Artificial pneumothorax has been used by a number of workers in cases of persistent pleural effusions, particularly if there is evidence of underlying parenchymal disease. In such cases a part of the fluid is removed and replaced with air. If this is not done when the fluid absorbs, the visceral and parietal layers of pleura usually become adherent and if progressive parenchymal disease is present its control by artificial pneumothorax is an impossibility. In some cases of bronchiectasis, artificial pneumothorax has been found of great value. However, in the more extensive cases, adhesions usually are present or it is impossible to obtain satisfactory collapse because of the pathological changes in the tissues. In pulmonary abscess artificial pneumothorax is rarely indicated in the acute stage, particularly if the abscess lies near the periphery of the lung. In such cases, frequently the abscess burrows into the pleural cavity and mixed infection empyema results. However, in some cases of pulmonary abscess located more centrally which have become subacute or chronic and have drained into the ramification of a bronchus, artificial pneumothorax when carefully administered may definitely hasten recovery. Moorman has found artificial pneumothorax valuable in cases of massive collapse. Usually only one or a few

administrations of air are necessary. In recent years a number of reports have been made in the medical literature, showing good results in treating lobar pneumonia by artificial pneumothorax. Here again usually only a few administrations of air are necessary.

The most extensive use of artificial pneumothorax has been in the treatment of pulmonary tuberculosis where good collapse of the diseased area of a tuberculous lung results in the closing of cavities, relief from symptoms such as disappearance of fever, reduction in pulse rate, increased appetite and disappearance of cough and sputum. The closing of cavities is purely mechanical, and the collapse results in blocking of the lymph circulation which prevents the poisonous products contained in the lymph from entering easily into the general circulation. The accumulation of the poisons results in a reaction which stimulates the growth of connective tissue. There is also a venous stasis which aids in healing. Gardner³⁶ made a postmortem study of fifteen cases of pulmonary tuberculosis treated by artificial pneumothorax and came to the conclusion that permanent anatomic alteration is dependent on the duration of compression rather than on the degree of pressure maintained. The alteration consists in the development of fibrosis in the pleura and connective tissue coats of the blood vessels and bronchi. This is always accompanied by a lymph stasis. He believes the fibrosis is due to the retention of metabolic products which cause a toxic stimulation as well as the pressure. He finds that the degree of permanent changes in the lung is dependent on the extent and degree of injury by the tuberculous process.

Even the tubercle bacilli may be injured by the damping up of their own products of growth. Coryllos³⁷ states that since the tubercle bacillus is a strict aerobe requiring large amounts of oxygen for continuation of life and growth, absence of oxygen interferes with its development. Collapse therapy decreases the amount of oxygen available for its growth. He believes that development of fibrosis is closely related to anoxemia.

Yoon³⁸ did some experimental work on rabbits, guinea pigs, and a dog in which he produced tuberculosis by human and bovine bacilli and studied the effects of artificial pneumothorax on the lesions. He came to the conclusion that pneumothorax has a favorable influence on chronic tuberculosis while in acute exudative disease it caused more marked caseous destruction and a more acute course. He found that in the non-caseated tuberculous processes, fibrosis progresses rapidly. He believes that tubercle bacilli die in the collapsed lung as a result of malnutrition.

Dock and Harrison³⁹ found that when the right lung of the rabbit is collapsed the total volume flow of blood is not greatly affected, but there is a decrease in the arterial oxygen content due to mixture of blood from the normal lung with blood of venous character, which passes through the unaerated tissues. During the first few hours after collapse, the lung does not become atelectatic; however, within a few days the collapsed

lung becomes airless and solid and the proportion of blood passing through it falls to less than one-fifth of the total flow. Therefore, they are of the opinion that since an analogous condition occurs in man, the therapeutic value of pulmonary collapse resulting from circulatory changes in the affected lung is due to ischemia.

Friedland⁴⁰ performed bilateral pneumothorax on forty-three dogs, cats, and rabbits and found that the carbon dioxide output, and the oxygen absorption are diminished. However, the total gas metabolism exceeds the normal, and the respiratory co-efficient is increased. The blood pressure is not appreciably increased.

Corper, Simon, and Rensch⁴¹ collapsed the right lung in rabbits shortly after intravenous injection of a suspension of virulent human tubercle bacilli and maintained the collapse for a period of one month. They found that it had no appreciable effect on the size or number of macroscopic tubercles in the lungs of the treated animals as compared to the untreated, or in the collapsed right lungs as compared to the left lungs.

Rolland⁴² and Roubier⁴³ have proved conclusively that no harm is done to that part of the lung which is normal but which may be collapsed in order to secure a sufficient collapse of the diseased area. Lichtenstein⁴⁴ studied the sensitivity of tuberculous patients and found that compression of the lung results in increased allergy. He finds that the more thorough the compression the greater the skin reaction. He says: "This again fits in with the theory that the skin reactivity depends upon the amount of tuberculo-protein liberated from the lesion. Apparently the sensitivity may be restored to a higher level when compression procedures cut down the circulation of the tuberculo-protein."

Another paradox in artificial pneumothorax work is the favorable action which one sometimes sees on the lesion in the opposite lung. Some believe this is due to slight immobilization through pressure on the mediastinum. Betchov⁴⁵ says that artificial pneumothorax is never restricted to one side alone, that the opposite lung is always somewhat affected; that the pressure against it may exert a healing influence on the contralateral lung also. Others are of the opinion that when toxemia from the more extensive lesion is reduced and disappears, and when tubercle bacilli are no longer being eliminated from the lesion, the resisting forces of the body are better able to control the lesion in the opposite lung.

The patient in whom artificial pneumothorax is indicated is fortunate, indeed, when no pleural adhesions are present, but if the disease has existed over a considerable period of time or has become extensive, some adhesions have usually developed. In fact, Sevier⁴⁶ found pleural adhesions prevent success of the treatment in more than 50 per cent of suitable cases. Other workers have made similar observations. Adhesions may vary from those which completely obliterate the pleural space to small string-like structures which interfere little or not at all, with the success of the treatment. Most persons who have had pleural effusion at some previous time have very extensive adhesions. Many who have

previously had pneumonia also have numerous adhesions. Matson *et al*⁴⁷, report that adhesions are almost invariably present over cavities. This is an undesirable condition for the end results of artificial pneumothorax cannot be as satisfactory when adhesions are present. This subject has been discussed by numerous authors, such as Pallasse¹⁸, Simon⁴⁹, Schill⁵⁰, Izzo and Aguilar⁵¹, and Lucacer⁵².

Enough reports on artificial pneumothorax treatment are now available to enable one to draw some fairly definite conclusions as to results obtained. Borelius⁵³ has shown that approximately 70 per cent of tuberculous patients without adhesions treated by pneumothorax are later able to work, whereas only 40 per cent with adhesions are able to do so. Macfie and Alexander⁵⁴ reported on two hundred cases in whom artificial pneumothorax was attempted. Forty per cent were in the third stage, 53 per cent in the second stage, and 7 per cent in the first stage when treatment was begun. They succeeded in collapsing the lung in 83 per cent; 57 per cent of this group were alive when the report was made, whereas only 38 per cent of those in whom treatment could not be administered were alive.

Maendl⁵⁵ made a study of 172 patients treated by artificial pneumothorax ten years after the first case was started. In all of these cases, the pneumothorax was continued two years or longer. He found that 51 per cent showed no improvement; 49 per cent were improved. Of the total 172, fifteen were cured; sixty-two able to work, and eighty-five were living. Burnand⁵⁶ called attention to a patient treated by artificial pneumothorax for thirty months who later died of another condition. The postmortem examination showed complete closure of the cavity.

Matson *et al*⁴⁷ studied the results of artificial pneumothorax on six hundred patients treated by artificial pneumothorax over a period of twelve years. Eighty-five of their cases were moderately advanced and 515 far advanced when the treatment was begun. They obtained satisfactory compression in 235, partial or unsatisfactory compression in 245, and found no free pleural space in 120. One hundred and forty-nine of the total six hundred were clinically well when the report was made, of whom 114 had satisfactory collapse, 28 partial or unsatisfactory collapse, and 7 were with no free pleural space.

Among Rist's 1,009 cases treated by artificial pneumothorax⁵⁷, 759 had chronic unilateral disease when the treatment was begun. Over a period of thirteen years he observed that 387 of the 759 cases were clinically well but that 336 of them were still under treatment. Of the remaining 372, 240 had died. The condition was unchanged in 33 and lesions in the opposite lung had developed in 99. In the remaining 250, he found it impossible to produce artificial pneumothorax because of pleural adhesions. Douglas⁵⁸ observed 396 patients with reference to fatality with effective and ineffective collapse. Of the 152 who had effective col-

lapse, 6 per cent were dead, of the 245 with ineffective collapse, 40.4 per cent were dead.

Poor results have been frequently reported in cavity cases. Plieninger⁵⁹ has shown that cavities located near the hilum usually are difficult to obliterate. Adler⁶⁰ has found that a few cases may have their disease continue to progress under artificial pneumothorax treatment. This is manifested by enlargement of the cavities, *etc.* In treating children, Fechter⁶¹ found that when cavities are present the results are less favorable. In such cases, it is more difficult to obtain good results with reference to negative sputum, or disappearance of sputum.

The Committee of the American Sanatorium Association on treatment consisting of Douglas, Peters and others⁷⁸ reported 360 cases with reference to tubercle bacilli in the sputum at the termination of artificial pneumothorax treatment. Of one hundred and fifteen, whose re-expansion was intentional, 66.1 per cent had negative sputum. Of two hundred and forty-five, whose re-expansion was unintentional, 46.9 per cent had negative sputum. They then observed 405 patients with reference to sputum at the termination of the treatment according to condition of the treated lung before collapse. One hundred and fifty-eight of these patients had considerable cavitation in whom 53.8 per cent had negative sputum. One hundred and one patients had moderate cavitation of whom 54.4 per cent were negative; ninety-seven had slight or no cavitation of whom 64.9 per cent were negative. Forty-nine patients had pneumonic consolidation of whom 57.2 per cent had negative sputum. They observed further, 186 living patients with reference to their condition one or more years after termination of treatment according to sputum at termination of treatment. Of this number, fifty-two had positive sputum on termination of whom 42.3 per cent were free from symptoms. One hundred and thirty-four had negative or no sputum at the termination of treatment of whom 85.8 per cent were free from symptoms. They also report 362 patients with reference to mortality according to sputum at termination of treatment. One hundred and sixty-two of them had positive sputum, 47.5 per cent were dead; two hundred had negative sputum or none, of whom 11 per cent were dead. Cutler⁶² reported a group of cases in which he points out that in every instance where the disease was confined to one lung and a successful collapse was obtained, the sputum became free from tubercle bacilli.

Artificial pneumothorax treatment has been extended to the minimal case of progressive pulmonary tuberculosis, where excellent results are obtained⁶³. Many patients who have the treatment instituted when the disease is minimal and even some with moderately and far advanced disease may remain ambulatory throughout the greater part or all of the course of treatment⁶⁴.

How long collapse by artificial pneumothorax should be continued in order to effect good control of the lesions has been a subject of considerable discussion. Of course, much depends upon the extent of disease and the progress of the case. If the disease is very ex-

tensive and numerous or large cavities are present so that little normal lung tissue remains, there is some question whether the lung should ever be allowed to re-expand. On the other hand, when the disease is minimal or moderately advanced and multiple or large cavities are not present, the treatment may be discontinued with a reasonable degree of safety but just when, is the question that no one can answer with certainty in any individual case. There are a number of cases on record who after six months to a year of collapse therapy, discontinued their treatment and have gone on to excellent recovery. However, there is a general consensus of opinion that such brief periods of treatment are not adequate. Rist⁶⁵ says that the habitual practice of allowing premature re-expansion is frequently disastrous. He likens it to throwing a man, who has been saved from drowning, back into the water. On the basis of actual observation of 189 patients in whom collapse was instituted between 1919 and 1921 and the patients traced as late as 1927, Rist and his co-workers concluded that security cannot be assured before the fifth year. Rist now maintains collapse for this period of time with excellent results. Jacquero⁶⁶ is of the opinion that in cases of severe advanced lesions, the treatment should be continued to the point of more or less complete fibrous transformation of the entire diseased lung and sometimes for life. In the case of more recent lesions, however, he believes that the time to allow re-expansion must depend upon the physician's judgment. He says, "We never will regret having kept it up too long, but we often may have to regret that we stopped it too soon."

In 45.1 per cent of Hoffschulte's⁶⁷ eighty-two patients, it was impossible to continue pneumothorax as long as six months; 54.8 per cent were treated for six months and longer, 36.5 per cent for twelve months and longer. Of the first group, clinical cures resulted in 5.4 per cent; of the second group 37.7 per cent; and the third group 43.2 per cent. The sputum became negative in 18.9 per cent of the first group; 71 per cent of the second group; 69.9 per cent of the third group.

The Committee of the American Sanatorium Association⁶⁸ on treatment observed 396 patients with reference to their condition one or more years after termination of treatment. Of the total number, 49 were dead one or two years after treatment. Of the remaining 347, two to three years after treatment, 19 were dead. Of the remaining 328, three years and more after treatment, 25 were dead. Of the remaining 303, with the interval unknown, 15 were dead. They also reported on 348 patients with reference to sputum at the termination of treatment according to time of re-expansion. One hundred and seventy whose re-expansion was established within the first year, 36.4 per cent had negative sputum; of 99 within the second year, 74.8 per cent were negative; of 46 whose re-expansion was established within the third year, 75.8 per cent were negative.

Amberson and Riggins³ traced 165 patients after the lung had re-expanded who had been treated by pneumo-

thorax for an average of five years. In eighty-nine, the cavities were permanently closed and 87.6 per cent were living, while 78.2 per cent of the living were able to work or lead normal lives. In seventy-six, the cavities were not completely closed and only 41.6 per cent of them were living of which 48.6 per cent were able to live normally. They are of the opinion that the duration of treatment after the cavities have been closed and the sputum has become negative, is more important than the total duration of treatment. Their patients do well after re-expansion if the cavities were kept closed from one and one-half to two years, the average total length of treatment in the most successful cases was from two to three years.

Pearson⁶⁸ advises that pneumothorax be continued at least three years. In his series, those who recovered were treated an average period of four years and four months. Neumann⁶⁹ believes the lung should be kept collapsed as long as is necessary for the formation of connective or fibrous tissue to replace the diseased tissue. He calls attention to the work of Ranke and Saugmann, the former recommending two years and the latter from two years in acute cases, and three to four years in chronic cases. Pearson⁶⁸ observed seventy-eight patients whose treatment was begun three to five years before his report. All of his cases were in the third stage and had positive sputum when treatment was begun. When he traced them he found that 42 per cent of those in whom pneumothorax was feasible were able to work and 50 per cent were dead. Of those in whom the treatment was impossible, only two were able to work and 64 per cent were dead. He points out that of those with pneumothorax who died, the average length of life was two and one-half years which was longer than similar untreated groups. Peters⁷⁰ found in his group of patients the end results in those having pneumothorax treatment were approximately twice as good as among those in whom no pneumothorax was possible. When satisfactory collapse was obtained, the chances of being alive after two to fourteen years were almost trebled and the chances of being in satisfactory condition were exactly trebled. He emphasizes the significance of bringing about the disappearance of tubercle bacilli from the sputum when satisfactory pneumothorax is possible. Burand⁷¹ is of the opinion that the lung should be collapsed for a minimum period of two years.

The Schilling haemogram has been found of value by such workers as Griesbach⁷² and Russew⁷³ in observing the progress of patients on pneumothorax treatment. Schneider⁷⁴, Papanicolaou and Weiller⁷⁵, Marotta⁷⁶, Cutler⁷⁷, G ripenberg⁷⁸, and Maendl⁷⁹ and others have discussed the sedimentation test in artificial pneumothorax. For the most part they find that with clinical improvement, there is diminution in the red-cell sedimentation values. Although the rate usually becomes normal when the patient does well on artificial pneumothorax, yet a normal rate is not a sufficient indication to discontinue artificial pneumothorax.

In all cases, we recommend that the treatment be con-

tinued for three years. At the end of that time we neither advise that it be continued nor discontinued. We know of no way to determine with certainty, when the disease is so well under control that there is no danger of subsequent reactivation. We have patients who have discontinued treatment after a short period of time and have remained free from symptoms⁸⁰. On the other hand, we have patients whose disease has reactivated after being on treatment five or more years.

The question often arises as to whether a lung kept under artificial pneumothorax treatment over a long period of time will re-expand. If the disease is very extensive the fibrous tissue may become so interwoven throughout as to prevent expansion when artificial pneumothorax is discontinued. In such cases, it is probably better that the lung does not re-expand, since there is always the likelihood of old cavities opening and reactivation of disease. In some cases with effusion, the visceral pleura becomes extensively involved and this prevents the re-expansion of the lung. However, these cases are not common. A much more frequent and unpleasant occurrence is the re-expansion of the lung through the formation of adhesions before one has completed the treatment.

When the lung is allowed to re-expand, adhesions usually form between the parietal and visceral pleura, thus making the re-institution of artificial pneumothorax impossible in a high percentage of cases. This is one of the reasons for continuing the treatment sufficiently long to insure the control of the disease. In the occasional case, however, it is possible to re-institute treatment. Hirschberg⁸¹ reports a case of successful resumption, ten months after the treatment had been discontinued, and Hutchinson⁸² recompressed a lung six years and three months after the last refill.

We no longer look upon artificial pneumothorax as a drastic procedure; in fact, it has become a standard method of treatment. To be sure, the procedure is attended by some danger but the accidents such as gas embolus and spontaneous pneumothorax are so rare as to be of little significance. Fishberg³² speaks of the harmlessness of the artificial pneumothorax procedure when used for diagnostic purposes. Here the procedure is no different than when it is used therapeutically except that in the latter the lung is kept collapsed over a longer period of time. Peters says: "The complications of pneumothorax are so few and their percentage so small as to be negligible." Rist⁶⁵ says that the risks of artificial pneumothorax are negligible when induced to cure pulmonary tuberculosis. When the lung is allowed to re-expand the pleural space usually becomes obliterated but this is far better than to allow obliteration to occur through progression of the disease before treatment is begun. The treatment does not interfere in any significant way with the heart and the circulation of blood nor does it result in any harmful blood changes. It does not interfere seriously with vital lung capacity or factors of respiration such as gaseous exchange, carbon dioxide tension, and the mechanical factors are normal

in persons with artificial pneumothorax. In cases who are dyspneic from toxemia, the breathing is improved and other symptoms disappear, in the majority of cases when the lung is satisfactorily collapsed. Even small lesions in the opposite lung are often benefited. Artificial pneumothorax inhibits the proliferation of tubercle bacilli and stimulates fibrosis. Therefore, the good which results far offsets the complications and the adhesions which form when the lung re-expands.

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Unit Method of Teaching Hygiene in College*

Helen L. Coops, Ph.D., and Laurence B. Chenoweth, M.D.**

Cincinnati, Ohio

IN RECENT YEARS attention has been focusing on a certain method in education called the unit plan of study. According to many observers the method is not new, but goes back to the beginning of the 19th century when Johann Friedrich Herbart (1776-1841), a German educational philosopher, proposed a certain method in presenting a given subject¹.

The followers of Herbart divided his method into five formal steps which they called "formal Herbartian steps."² The steps were (1) preparation, (2) presentation, (3) association or comparison, (4) generalization or abstraction, and (5) application.

Various additions and special applications have been made to the general principle by a number of prominent educators³.

Various unit plans are being put into operation in the teaching of various subjects among which is hygiene. The older methods of teaching hygiene had a tendency to be ineffective. Many facts were presented to students which had no practical value. On the other hand, there were many subjects omitted which may very well have been included because of interest in them. The unit plan has been adopted as a device to help vitalize the subject of hygiene teaching. There are almost as many variations of the unit plan as there are instructors in the different institutions. The educational literature shows frequent references to many variations of the scheme.

One of the main advantages of the unit plan as usually applied in college hygiene courses is a division of the subject matter into units. The units should not be too large, should not include too much material. One advantage of the unit method in college is that the instructor may receive instruction from the student. In digging up material on so active and growing a subject as health instruction it is not unusual for a student to present material which is news to the instructor.

What the Unit Method Is

To quote a recent author, "The central fact of the unit idea is that content should be studied as complete meaningful wholes rather than in isolated or unrelated lessons or bits."⁴

The unit system is primarily a point of view in which the instructor acts as a leader and a joint discoverer with a class, in search of some desired information. The older traditional method presented the instructor as a ring-master who gave out periodic assignments, conducted drills, and then tested the memorized material. According to the unit method the same material is covered in classes; but the manner of presentation of subject matter and its subsequent development is usually quite different.

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**University of Cincinnati, Cincinnati, Ohio.

An example of this method is the modern teaching of a class in college hygiene. The instructor presents a series of suggested units, with brief outlines of suggested developments. The class discusses the units in general, and the instructor points out interesting and important features. The outcome of the discussion (if it is properly led) is the expression of a desire to investigate topics. The instructor may suggest methods and help with organization of the class into smaller groups of from three to nine students for separate investigations and reports. These separate investigations and reports then lead to further activity if the instructor is skillful in integrating material and directing its course along the channels he originally had in mind.

The secret of the method is to make the students think that they have selected the topics to be investigated and that their efforts are based upon felt needs for information. The resulting study is then self-motivating, becoming both purposeful and meaningful to the student. Text-books and other available literature become source materials in case of need rather than a patent medicine dose to be taken in gulps of 20 pages each. Instead of learning the muscles of the body and the various systems, in isolated learning, the student investigates the material because he can thus understand more fully such personal problems as: how to defend himself against infection, the value and limitation of drugs in illness, the use of immunizing substances, mental hygiene and the development of an acceptable personality, the significance of motor activity in modern life, and many other subjects of vital importance to the college student himself.

How a Given Unit Is Presented to a Class

The first step in actual presentation is to appeal to what students actually know about a given topic and to get them to express their own feelings concerning their individual knowledge or experiences.

The next step is to present new and startling information concerning the topic. This information should be interesting and pertinent in order to stimulate their curiosity and imagination. It should be so stated that students are personally aroused, either because of a desire to know more or because of the chagrin of ignorance. In all cases such a reaction should be directed toward activity because of a desire to investigate.

The final step (in presentation) is for the group, in cooperation with the instructor, to outline tentative methods of solving the felt problem or project.

Specific examples of subject matter were first given out of which general topics or trends developed. Subsequent investigation or study should revert to the specific, including detailed analysis and scrutiny.

What an Instructor Does in Preliminary Work

1. He sets up personal goals in terms of the purpose of the teaching and expected accomplishments. He should know in general what he expects the class to learn although he cannot foresee the exact methods and the details of procedure.
2. He should know as much as possible about his group—the answer to such questions as:
 - (a) What general individual characteristics have students at that age? Individuals vary within the group, but a twenty-year old student is quite apt to have typical problems and desires which are due to his age and stage of physical, mental, and social development.
 - (b) What sort of homes do they come from and what sort of a community do they live in? Are they comparatively well-to-do or do they come from a section with low socio-economic status? Factors of this sort have much to do with health teaching. A class discussion of the effects of alcohol is far different when the majority of students come from homes where cocktail drinking is a daily and accepted habit than when students come from conservative country districts.
3. The instructor should be personally well informed on his subject, in terms of:
 - (a) History and details of subject matter.
 - (b) Recent investigation, research and experimentation.
 - (c) Source material—either in printed material or local happenings. A unit on the college health examination may serve as the basis for investigation of methods of prevention of common bodily defects. This may in turn lead to investigation of body structure in the normal person.

The Place of the Instructor

The instructor should be the person to "set the stage" for an interesting play. He should have the point of view that people learn primarily through their own efforts and activity. His job is to guide the process, to utilize the resources of the college and the community in making the activity personal and real, to make quick use of unexpected developments and situations by swinging them into line. His own pre-established objectives serve as a focus and he merely guides student activity toward this focus. He somehow should get the class to realize that his function is:

1. To aid the process of study by giving out any suggested or requested information.
2. To explain short cuts in the process—because of his own knowledge and experience.
3. To help organize and correlate these separate acquisition of knowledge.
4. To evaluate individual quality and quantity of work by periodic quizzes or examinations.

The Main Difficulty in the Unit Method

The most persistent problem is the fact that the instructor must have initiative, foresight and ingenuity.

He must have more knowledge of his subject than the instructor who "keeps ten pages ahead of the class assignment." He must know more of the individual characteristics and motives of his students than the old type teacher who was concerned merely with passing out subject matter. He must be a human being who is interested in other human beings. He must think of education as living and not just a text-book memorization.

There are rewards for this effort. The business of teaching becomes far more interesting for the instructor as well as the student. Invariably students work more willingly and do much more. Subject matter becomes more vital and related to life—not just the remote and sterile process that has characterized the teaching of hygiene in the past.

Examples of Units

The unit may be long or short. A whole course may be thought of as one unit, or a number of subdivisions may each serve as such.

In order to make use of a fortuitous circumstance, malaria, its transmission and prevention may be considered as a unit. In the autumn of 1936, just after the opening of a certain university, one of the professors returned to his work after a long cross-country drive from California. A week or ten days after his arrival he came down with a typical case of malaria. He is well-known and popular and students began to discuss his case and to marvel at the seriousness of his illness. The *approach* was ready made for an instructor who could seize the opportunity. Interest was manifest in malaria, which had not visited this campus for a number of years. To help in the approach, students remarked that the university's archaeological expedition which goes to the site of ancient Troy in Asia Minor every February and returns in September, came home without any malaria among them. Not only that, but none of them have had any malaria for many years, and some of them never at all. This in spite of the fact that malaria is notoriously prevalent and endemic in Asia Minor.

The *objectives* of the unit may be outlined somewhat as follows: (1) to acquaint students with practical and scientific information concerning the transmission of malaria, (2) to make a study of the history and present status of the disease, (3) to learn the personal prophylaxis of this disease.

The *procedure* of study in such a case could be outlined somewhat as follows: those students interested in electing to report on this unit appoint a chairman, who is *not* expected to do all the work, but to serve as a co-ordinator, to bring about coöperation among the students working on the unit. One of the members of the "committee on malaria" assumes the duty of assembling the main biological facts concerning the malarial mosquito. Another looks up the history of malaria, the scientific facts concerning its transmission and its characteristics. A third volunteers to interview the convalescing professor. A fourth interviews the director of the archaeological expedition just returned from Troy. Cer-

tain definite things are brought out by members of the group:

1. The teacher returning from the West told of the long day and night driving required to get back to the university.
2. It was learned by study that the malarial mosquito bites mostly after sunset, therefore night-driving through malarial infested country is especially hazardous.
3. The archaeological expedition reported
 - (a) That they lived in well-screened houses.
 - (b) After sunset they remain indoors.
 - (c) They do not take quinine as a prophylactic.
 - (d) Year after year they are exposed to malaria, yet never contract it.

The *references* concerned in the study are brought to class and reveal an interesting story: malaria was a prevalent disease of the ancients. It probably had much to do with the decline of ancient Greek and Roman civilizations. It was not until recent years (1894) that the disease was definitely known to be carried by a certain type of mosquito (discovered by Ross or Grasse?). Many interesting biological and medical facts about malaria and the mosquito are brought out and made practical for the student.

The student should be led to *activity*; to see the needs of mosquito elimination in his community and, in case he were traveling in the South, he should follow a routine which would protect him from the possibility of contracting malaria.

The story of malaria as an insect-borne disease raises the question of what other diseases are transmitted by insects and other units are suggested by the coöperative work of students and instructor. If the students think of desirable units, their interest should be recognized and their suggestions followed. If not, the instructor should point out what units should naturally follow.

Examples of Unit Teaching in University Health Courses

1. Personal Hygiene for Women (Dean Katherine D. Ingle and Dr. Marian A. Boyd.)

Introduction and Unit I

Introduction: Scope of personal hygiene—modern emphasis on positive and social viewpoint. Correlated with facts presented in community hygiene.

Unit I: Heredity, eugenics, and eugenics.

- A. Problems of heredity
 1. History of study of heredity
 2. Laws of heredity.
- B. "The way life begins"
- C. Heredity *vs.* environment
- D. Eugenics and eugenics

Bibliography

Unit II: The Orientation of the Student in the Health, Physical Education, and Guidance Programs

A. The guidance program

1. Trend toward individualization

2. Changes in society:

- a. Those which have occurred in the past
- b. Those which are needed in the future

3. Changes in college curricula

4. Possible modifications in behavior

5. History of personnel viewpoint

6. History of physical education in schools and colleges

7. History of education for women in the United States

B. The orientation of the student in fields other than health

C. Objectives of the physical education and health programs

1. Individual needs met by physical training

2. Health program (physical examination, classes, conferences, *etc.*)

3. Desired results

D. Significance of motor activity in the history of man

1. The evolutionary, recapitulation, and other theories

2. Classification of motor activities

E. Activity in the various periods of childhood

F. Physical activity on the college level; exercise problems

Unit III. Defensive health measures

1. Care of skin

a. Structure and function

b. Disease of skin and their prevention

2. The skeletal system—posture, abnormalities of feet

3. Hygiene of the digestive system

4. Head—eyes, ears, nose, mouth, throat

5. Reproductive system and sex hygiene

6. Endocrine system

7. Circulatory system—heart disease and its prevention

8. Drugs, useful and harmful

9. Common diseases and their personal prophylaxis

Unit IV: Constructive health measures

1. The newer knowledge of nutrition

2. Physiological aspects of sleep

3. Conservation of vision and hearing

4. Adequate medical and hospital service

5. Problems of physical activity and recreation in college and later

6. The accident problem

7. Social relations and the problems of mental hygiene

2. Orientation in health education for freshmen women (Harriet Rowley)

Steps:

A. Pre-test for background

B. Questionnaire for interest (Students)

C. Appeal to authority (Faculty and others)

D. Study of findings of health examination

3. Sample 6-weeks course to senior men and women—units (according to expression of personal interest and desire for information) (Dr. Coops).

- A. New phases of mental hygiene
- B. New phases of social hygiene
- C. Research and history of medicine and public health
- D. Consumers' Research and buying and legislation
- E. Personality in relation to vocational success

Topics selected by students. Instructor directed specific choice of investigation under each topic

- 4. Methodology in health education for professional students (seniors) (Dr. Coops)

Main topic: Actual methods of presenting health materials to various grade levels and various types of persons

Appeal to students:

1. You have had various courses containing various subject matter.
Professional courses: anatomy, physiology, hygiene, physical diagnosis, *etc.*
Educational theory: principles, methods, class management, statistics, *etc.*
Related courses: speech, psychology, *etc.*
2. You may soon be in a practical situation where you will have to integrate all this material. Do you know how to teach social hygiene in a high school; could you present a unit on milk to second grade children; could you present posture effectively in the junior high school? In other words, can you integrate all you have learned and apply it practically?
3. Do you know local or national resources of materials for health teaching? Do you know how to keep up with things that are happening in the world? Can you see the field of health education in terms of educational trends and present-day American life?

4. Finally, how would you like to go about acquiring this information? What definite practical measures can be undertaken that would be of most practical help to you? How can I, as instructor, be of most help in the process?

On the basis of these discussions limits were set up by the class:

1. Definitions, terminology, and administrative relationships of school health education.
2. Source materials—(addresses, prices, and descriptions) Books, periodicals, and pamphlets. Health organizations; federal and local, private and semi-private, commercial. Materials other than printed: visual education, activities in school, home and community, *etc.*
3. Certification and training standards: major, minor and courses for non-specialist. Standards and minimum essentials.
4. Opportunity to work out a health curriculum in selected situation.
5. Work on individual problem selected because of personal interest or because of felt lack of knowledge.
6. Knowledge of contemporary findings—literature of field and significant recent findings.

Methods: Group investigations (2—4 individuals)—reports, discussion. Mimeographed summaries.

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3. See Umstattd, J. G., *Secondary School Teaching*, Boston, Ginn & Co., 1937, pp. 147-175.
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Physiological Principles of Importance in Heart Failure and Its Treatment*

Maurice B. Visscher, Ph.D., M.D.**

Minneapolis, Minn.

THE HEART is of importance only because it serves to provide the motive power for the circulation of the blood. Consequently, its efficiency as a machine for doing work is its most important property. The failing heart is unable to perform as much work as a normal heart in propelling blood around the circulatory system. In order to treat heart failure intelligently we must know the defect in the heart muscle that is responsible for its inability to do work.

In any machine the amount of work that can be done depends upon two factors, the amount of energy available and the proportion of that energy that can be con-

verted to useful work. Machines are never 100 per cent efficient in converting energy to work, and under the best conditions the heart is approximately 20 per cent efficient, that is to say, for every 100 units of energy liberated in contraction, only 20 are capable of appearing as work. The remainder is dissipated as waste energy or heat.

In studying the physiology of the failing heart it is important to know whether its defect lies in an inability to liberate energy sufficient to carry its load or in a disability to convert the proper fraction of the energy to useful work. Experiments have been designed to determine this question by observation. It is very difficult, if not impossible, to measure the total energy liberated by the heart beating *in situ*. By the use of the

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**Chief, Department of Physiology, University of Minnesota, Minneapolis, Minn.

isolated heart in the Starling heart-lung preparation, however, it is possible to make such measurements where the oxygen consumption of the preparation can be measured, and after correcting for the oxygen consumption of the lungs, the remainder of the metabolism can be assumed to be that of the heart itself. Extensive studies by Starling and Visscher, 1927; Clark and White, 1928; Gremels, 1933; and Decherd and Visscher, 1934; among others, have shown that the energy liberated in cardiac contraction is a function of the fiber length. At the beginning of the contraction the fiber length is measured by the volume of ventricles, the volume at the end of the diastole, or, in other words, at the moment at which contraction begins. It is the factor that determines the energy liberation in the next systole. It has been shown that in the normal heart the energy liberation is greater the longer the fibers are at the instant of contraction, thus the more dilated the ventricles are, the more energy they are able to liberate.

With respect to clinical physiology, the important question is as to whether this relationship between the diastolic ventricular volume and energy liberation holds in the case of cardiac failure. The observations, particularly of Peters and Visscher, 1936, show that this is strictly true. It was found that no matter how little work a heart was able to do after it had failed in the heart-lung preparation, the total energy consumption at a given diastolic volume was the same as it was in that heart when it was working vigorously when fresh and normal. The failing heart has become a spend-thrift, so to speak, in its utilization of energy. It can do less and less work with a given amount of energy with progressive failure, so that instead of having an efficiency of 20 per cent, that factor may fall to less than one per cent. In such a case more than 99 per cent of all the energy the heart puts out in contraction is wasted. Thus it can be said that the failing heart, at least in the heart-lung preparation, is simply an inefficient heart.

There are reasons for believing that the situation is not essentially different in the case of failure in the clinical sense. The behavior of the heart in the isolated preparation and in man in failure is similar in several important respects. First, in that it dilates to accomplish a constant load of work in both cases. To be sure the dilation occurs faster in an acute experimental failure than in man, but this is partly due to the restraining influence of the pericardium in man, and presumably to the slower rate at which the process of deterioration occurs in the intact organism. Furthermore, the similar actions of drugs in the two cases, to be mentioned later, gives further evidence that the essential processes are comparable in the isolated heart and in the intact organism.

An understanding of the mechanism of failure from a physiological point of view is chiefly significant to the clinician in providing a basis for rational therapy. If the defect in heart failure is a decrease in the mechanical efficiency of the heart muscle, the obvious aim of treatment should be to restore the efficiency to normal. It is

a matter of observation that imposing heavy loads of work for long periods of time upon the heart causes it to lose efficiency. Working at moderate loads, on the other hand, results in improvement in efficiency after periods of over-loading. It is apparent, therefore, that decreasing the load of work imposed on the heart to as low a figure as possible will give it an opportunity to recover its efficiency. From a practical point of view it is the muscular work of the body in movement that calls for the greatest increases in the work of the heart. Therefore, muscular exertion must be reduced to a minimum and the common clinical practice of putting cardiac patients at strict bed rest finds its justification from a physiological view point.

An extra load is also thrown upon the heart after ingestion of food. Thus, after moderate meals, Grollman and others have shown that there is a fifty per cent increase in the circulation rate. The association of acute cardiac episodes with the eating of a hearty meal is therefore not an accident, and the fatal heart disease mistaken for acute indigestion has its physiological basis in the circulatory processes associated with the intake of food.

The importance of the heart rate upon the efficiency of the circulation was pointed out by Starling and Visscher. They showed that the heart was only 60 per cent as efficient at a rate of 170 as it was at 90 in carrying a given load of work. Thus, other things being equal, it is physiologically desirable to keep the heart rate as low as possible, since this factor in itself has such a profound effect upon efficiency.

The most important practical information at hand relating to the influence of the cardiac drugs upon the efficiency in the failing heart concerns the mechanism of action of digitalis. It has been shown by Gremels, and Peters and Visscher, that the efficiency of doing work increases markedly in failing hearts treated with digitalis glucosides; Gremels used strophanthin and lanidigin; while Peters and I used scillaren, ouabain, digitalid and strophanthin. These agents are able to increase the efficiency of the heart as much as 200 per cent and may restore a failing heart practically to normal in this respect. The fact that digitalis glucosides are capable of permitting the heart to do larger amounts of work at a given energy liberation is obviously of importance to our view of the way in which digitalis has its therapeutic action. It is a drug which permits the heart muscle to carry a given load of work at less cost to itself, and therefore, with a lower metabolism going on. It requires less fuel and fewer materials for repair. Any agent which has such an effect should be useful in the treatment of the failing heart.

Anesthetics as a rule have a deleterious effect upon the efficiency of the heart muscle. Sodium amytal in anesthetic concentration produces a 40 per cent decrease in efficiency. Ethyl alcohol comes in the same category. Its effects have been studied by Peters, Rea, and Grossman, who showed that the efficiency decreased markedly when the concentration of alcohol in the blood was

greater than 0.2 per cent. Certain agents used as cardiac stimulants also have a deleterious effect upon the efficiency; conspicuous amongst these is coramine, which, according to these observations, is certainly not a useful cardiac tonic, whatever its other effects may be. In this connection it should be noted that the expression, *circulatory stimulant*, has a very indefinite physiological meaning; and that agents may have useful effects on peripheral circulation and at the same time have deleterious actions on the heart. Their dangers, however, should be recognized if they are to be used. Since coramine has a damaging effect upon heart muscle in the heart-lung preparation, it seems very doubtful whether it should be used clinically when the critical factor for the life of a patient is the efficiency of his heart muscle. If the heart is not in the state of failure, there would perhaps be no danger in the administration of substances which themselves tend to cause heart failure as coramine does in the heart-lung preparation.

These physiological studies have pointed to the importance of a consideration of the heart as a machine for utilizing energy in doing work. As a machine it becomes less efficient in failure, and its treatment by such tonics as the cardiac glucosides results in an improvement in its efficiency. Other factors have become evident which also point the way to the establishment of conditions under which the heart can recover its lost efficiency and thereby be made more capable of carrying the loads that are imposed upon it.

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BOOK NOTICES

A MIGHTY WORK

Abortion—Spontaneous and Induced, by FREDERICK J. TAUSIG, M.D.; first edition, heavy cloth, gold-stamped, 526 pages, 146 illustrations, indexed; Saint Louis, Missouri, the C. V. Mosby Company; 1936; \$7.50.

American physicians treat no less than 100,000 cases of abortion annually; but how many cases (both spontaneous and induced) never have the physician's care?

The C. V. Mosby Company declares, and with truth, that no greater authority on abortion than TAUSIG exists. Professor of clinical obstetrics and gynecology for many years in the Washington University School of Medicine at Saint Louis, TAUSIG has devoted the greater portion of his life to this subject. He spent two years in the abortion clinics of Russia; and his collection of data and statistics on the subject is world-renowned.

This book is the summation of that experience. Every medical aspect of abortion is considered and treated; diagnosis, prevention, and treatment are concisely offered. The social, religious, and economic considerations are included. It is the first complete discussion of the subject in any language.

THE JOURNAL-LANCET recommends this work without qualification. It is difficult to imagine informed obstetrical practice without it.

MacLEOD'S PHYSIOLOGY

Physiology in Modern Medicine, by J. J. R. MacLEOD, M.B., LL.D., D.Sc.; assisted by PHILIP BARD, EDWARD P. CARTER, J. M. D. OLMSTED, J. M. PETERSON, and N. B. TAYLOR; 7th edition, 297 illustrations (7 color plates), 1,104 pages plus references and index, heavy green washable cloth, stamped in gold; St. Louis, Missouri: The C. V. Mosby Company; 1935. Price, \$8.50.

This is a text which probably every physician, and certainly every medical student, either owns or hopes to own; for it is a work which most physicians of today cannot be without. When the first edition of this text appeared Professor MacLEOD was at the University of Toronto in Canada; now he is in Aberdeen, Scotland. The passing of the years has only made his work more imminently valuable.

Biochemistry does not play so important a rôle in this edition as it has in previous printings; obviously because biochemistry is no longer ancillary to medicine, but is almost a specialty in

itself. It is significant, too, to see that Professor MacLEOD has given the neuro-muscular and the central nervous system extensive revision. The section on circulation (CARTER) is revised, and the introductory chapters are new (PETERSON). The index is re-worked, and the references are painstakingly accurate.

This is a text which should be in the physician's library even before he receives his diploma and licentiate.

POPULAR OBSTETRICS

Into This Universe, by ALAN FRANK GUTTMACHER, M.D.; first edition, blue cloth, silver-stamped, 342 pages plus bibliography and index, 15 illustrations; New York: The Viking Press; 1937. Price, \$2.75.

This book does not differ from several other works on the subject of obstetrics for the lay reader appearing in recent years; but it is competent, and it is well-written. Part of it is devoted to the razing of old superstitions, many of which have even been fostered by medical men! A pleasing characteristic of this book is that Dr. GUTTMACHER frequently quotes illuminative points from his own experiences in active practice, a technic already used to advantage by CHIDECKEL, ROBERT MORRIS, CUSHING, and others. The author is an associate in obstetrics in the Johns Hopkins University School of Medicine. The work is sound, and would be enjoyed by any lay reader; and in point of fact, by many physicians, also.

A NEW PHARMACOGNOSY TEXT

Materia Medica, Toxicology & Pharmacognosy, by WILLIAM MANSFIELD, A.M., Phar.D.; 1st edition, red cloth, stamped in gold, 202 illustrations, 682 pages plus index; Saint Louis: The C. V. Mosby Company; 1937. Price \$6.75.

This is an admirable text, beautifully suited to the needs of the physician, for it has not only a good section on toxicology; but also it conforms to the *U. S. Pharmacopoeia XI* and *The National Formulary VI*. Drugs are classified for ready and easy reference, descriptions are systemized, and there is a working photograph of each vegetable and animal drug. And under each drug is given its Latin name, its abbreviation, English name, synonym, botanic name, part or parts used, impurities, assay, ash, habitat, description, constituents, dose, preparations, properties, uses, and its toxicology, if it has any. From this it may be seen that this is one of the most utilitarian texts ever produced for the physician in pharmacognosy. THE JOURNAL-LANCET commends the author.

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Almas, David Joeseeph	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Andresen, Karl d'Autremont	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Bachnik, Francis Wilfred	U. of Minn., M.B., 1936	St. Mary's Hospital, Duluth, Minn.
Blegen, Halward Martin, Jr.	U. of Minn., M.B., 1936	Cincinnati Gen. Hospital, Cincinnati, O.
Boland, Edward Ward	St. Louis U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Bond, Thomas Arthur	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Burton, John LeRoy	U. of Minn., M.B., 1935, M.D., 1936	1844 E. 26th St., Minneapolis, Minn.
Carley, Walter Arthur	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Chauncey, Lester Robert	U. of Toronto, M.D., 1934	Mayo Clinic, Rochester, Minn.
Clay, Lyman Birney	U. of Minn., M.B., 1936	St. Barnabas Hospital, Minneapolis, Minn.
Coombs, Carl Herman	U. of Minn., M.B., 1935, M.D., 1936	St. John's Hospital, St. Paul, Minn.
Cumming, Harry A.	U. of Minn., M.B., 1936	Northwestern Hospital, Minneapolis, Minn.
Delmore, John Leo, Jr.	U. of Minn., M.B., 1936	St. Mary's Hospital, Duluth, Minn.
Dickson, Douglas Dwight	U. of Neb., M.D., 1935	Mayo Clinic, Rochester, Minn.
Dockerty, Malcolm Birt	Dalhousie U., M.D., 1934	Mayo Clinic, Rochester, Minn.
Dowidat, Raymond William	U. of Minn., M.B., 1936	St. Mary's Hospital, Minneapolis, Minn.
Drachman, Theodore S.	U. of Minn., M.B., 1937	Kings Co. Hospital, Brooklyn, N. Y.
Ellis, Fred Arthur	U. of Minn., M.B., 1936	1407 Russell Ave. N., Minneapolis, Minn.
Fisketti, Henry	U. of Minn., M.B., 1936	213 Mesabe Ave., Duluth, Minn.
Fredlund, Melvin L.	U. of Minn., M.B., 1936	K. C. General Hospital, Kansas City, Mo.
Friedell, Morris Theo.	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
Gates, Phillip Howe	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
Halladay, George John	U. of Minn., M.B., 1936	Northwestern Hospital, Minneapolis, Minn.
Hardiman, John Albert	U. of Minn., M.B., 1937	K. C. General Hospital, Kansas City, Mo.
Hargraves, Malcolm McCallum	Ohio State U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Hartnagel, Grant F.	U. of Minn., M.B., 1936	Milwaukee Co. Hospital, Wauwatosa, Wis.
Hawn, Hugh William	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
Hillis, Samuel Joseph	Trinity U., M.D., 1904	806 Sheldon Ave., St. Paul, Minn.
Hollister, Clinton Bennett Hale	Columbia U., M.D., 1934	4921—1st Ave. S., Minneapolis, Minn.
Holman, John Crafford, Jr.	Tulane U., M.D., 1934	Mayo Clinic, Rochester, Minn.
Kaiser, George Daniel	U. of Minn., M.B., 1936	University Hospital, Minneapolis, Minn.
Lilleberg, Norbert John	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Lundblad, Stanley William	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
McCain, Donovan Legare	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Marking, George Henry	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
Marks, Roger Weston	U. of Minn., M.B., 1936	176 Concord St., St. Paul, Minn.
Mollers, Theodore Peter	U. of Minn., M.B., 1936	St. Mary's Hospital, Minneapolis, Minn.
Neumaier, Arthur	Duke U., M.D., 1935	St. Mary's Hospital, Duluth, Minn.
Nordholm, Vincent William	Northwestern U., M.B., 1936	Fairview Hospital, Minneapolis, Minn.
Norris, Neil Thomas	U. of Minn., M.B., 1936	St. Mary's Hospital, Minneapolis, Minn.
Nuebel, Charles Joseph	U. of Minn., M.B., 1936	St. Joseph's Hospital, St. Paul, Minn.
Page, Robert Clinton	Syracuse U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Palmer, Harry Allen	U. of Minn., M.B., 1936	St. Luke's Hospital, Duluth, Minn.
Paulson, John Albert	U. of Minn., M.B., 1936	537 Third Ave. N. W., Rochester, Minn.
Penheiter, Donovan	Northwestern U., M.B., 1936	Bagley, Minn.
Rokala, Henry Emil	U. of Minn., M.B., 1936	Biwabik, Minn.
Rolig, David Howard	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Rosenstiel, Henry Carl	U. of Ill., M.D., 1935	Mayo Clinic, Rochester, Minn.
Rutledge, David Ivan	U. of Neb., M.D., 1934	Mayo Clinic, Rochester, Minn.
Sandell, Samuel T.	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Schneidman, Norman Reuben	U. of Minn., M.B., 1936	1414—6th Ave. N., Minneapolis, Minn.
Shapiro, Jesse	U. of Minn., M.B., 1936	Ancker Hospital, St. Paul, Minn.
Sheinkopf, Jacob Allan	U. of Minn., M.B., 1934, M.D., 1935	Co. 712, C.C.C., Grand Marais, Minn.
Skogland, John Edmund	U. of Minn., M.B., 1935	412 Delaware St. S. E., Minneapolis, Minn.
Stroebe, Charles Frederick, Jr.	Rush Med. Col., M.D., 1937	Northfield, Minn.
Tenner, Robert Johnson	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Tisher, Paul Winslow	U. of Iowa, M.D., 1935	1072 Portland Ave., St. Paul, Minn.
Tweedy, John Archibald	U. of Minn., M.B., 1936	352 Main St., Winona, Minn.
Weaver, Delmar Franklin, Jr.	U. of Va., M.D., 1932	Mayo Clinic, Rochester, Minn.
Whetstone, Stuart Daniel	U. of Minn., M.B., 1935, M.D., 1937	Owatonna, Minn.
Whitney, Richard Aurie	U. of Minn., M.B., 1936	Asbury Hospital, Minneapolis, Minn.
Whittemore, Dexter Delmont	U. of Minn., M.B., 1935, M.D., 1936	Ancker Hospital, St. Paul, Minn.
Wilson, Robert Bruce	U. of Ill., M.D., 1933	Mayo Clinic, Rochester, Minn.

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MINNEAPOLIS, MINN., JULY, 1937

HAIL TO THE CHIEF

The JOURNAL-LANCET takes pride in recording the honor that has come to the chairman of its editorial board during the past month. Dr. J. A. Myers was elected president of the National Tuberculosis Association at its annual meeting in Milwaukee during the first week of June and was also elected president of the Academy of Tuberculosis Physicians at the academy's annual meeting in Atlantic City the following week. That's making it unanimous, wouldn't you say?

It takes qualification to arrive, work to attain, and achievement to gain renown. We are indeed happy to have this well deserved recognition come to one of our members. Others have served as presidents of the American College of Physicians, the American Proctological Society, and the American Student Health Association but Dr. Myers has been chosen to preside over two national organizations in the same year.

There should be a correlation of tuberculosis physicians in one body making a single national group. This election may lead to such a consummation. Members of both organizations have expressed that hope.

A. E. H.

MEDICAL DEFENSE PLAN OF STATE MEDICAL ASSOCIATIONS

During recent years both the law and the medical professions have become keenly cognizant of what they

designated corporation practice, *i. e.*, an interference in the respective fields of their professions, *viz.*, as regards law, the practice of many banks (banks) in combination with their trust departments to aid their patrons draw wills, act as legal trustees, *etc.* Now, the pinch either of an excessive number of attorneys or greatly reduced revenue to the legal brethren, or both causes, has lately led to a vigorous attack by the Blackstones against some of the state medical associations carrying the medical defense plan, their particular object evidently being against the Ohio State Medical Society. The medical journal of that State for June, 1937, advises its membership that owing to the complaints of the past several years, and particularly the irritation caused since 1935, said State Society will discontinue as of date June 15, 1937, its medical defense plan; this in deference to the results of a conference had with a joint committee on interference, whereby the ruling was made that such medical defense practice was actually the illegal practice of *law*. North Dakota State Medical Association discarded some years ago that form of defense, therefore is not affected by the ruling, yet the A. M. A. headquarters intimate that possibly other state associations may be interested in this decision.

What organization will next be the conscientious and mercenary objector against *something*?

A. W. S.

THE JOURNAL-LANCET AND THE EARLY DIAGNOSIS CAMPAIGN

The stress laid upon tuberculosis by the JOURNAL-LANCET during the past few years has taken into consideration the fact that the Christmas seal of the National Tuberculosis Association and some of the projects it has financed, particularly the Early Diagnosis Campaign, has stimulated widespread interest in tuberculosis, not only among physicians but also in the general public. It has frequently been said that education of the public in the modern aspects of tuberculosis control has exceeded that of the medical profession. Obviously such a situation should never be permitted to develop. To be sure, we should not in any way curtail the educational program for the public but should support it in every possible manner. At the same time, there should be made available in concentrated form all of the newer information for the physician for it is he who must make the diagnosis, administer the treatment, and direct the program of prevention. In this manner, most can be accomplished in the eradication of any disease. Therefore, every possible effort has been made to procure and publish articles which provide all the information the physician needs. These articles have contained condemnations of procedures at one time used but now known to be almost worthless or futile, such as the tuberculosis clinic of former days, which often required one physician to examine as many as a hundred persons in a single day.

Emphasis has been placed on the modern diagnostic procedures, including the tuberculin test as a fine screen, the X-ray as a coarse screen, followed by adequate clinical and laboratory examinations to determine diagnosis, treatment indications, etc. As a result of bringing the modern viewpoint on tuberculosis control so frequently to the desks of physicians, large numbers have adopted them, are using them daily in their offices, and are thus aiding their communities in the eradication of tuberculosis. The development of programs and the actual accomplishments in tuberculosis control in North and South Dakota, Montana, and the student health services of America, during the past few years are almost unbelievable. More has actually been accomplished in these places in the past few years than in the immediately preceding quarter century.

The best evidence that points toward eradication of tuberculosis is the definite and persistent decrease in mortality from tuberculosis, with parallel decreases in morbidity and infection. Indeed, in places the mortality from tuberculosis has become so low that we are in grave danger of having the workers, including physicians, relax their efforts under the impression that the victory against tuberculosis is practically won. Such an attitude is extremely dangerous for we must constantly keep in mind that wherever there has been a death from chronic pulmonary tuberculosis, there are numerous associates of the person who has lost his life in whose bodies cultures of tubercle bacilli have been established. Every one of these persons is a potential case of clinical

tuberculosis, even though the only finding at present may be a positive tuberculin reaction. Thus, our criterion as to the magnitude of the tuberculosis problem in any community must no longer be only the mortality rate in that community but also the incidence of positive tuberculin reactors. A very pertinent fact in tuberculosis control work is that, generally speaking, only positive tuberculin reactors develop clinical tuberculosis. Since the appearance of sensitiveness to tuberculin represents the beginning of tuberculosis, we can not rest upon our laurels until this category has definite provisions made for them.

J. A. M.

SOCIETIES

Annual Session of the Montana State Medical Association July 13th and 14th, 1937

"The Most Friendly Meeting You Ever Attended"

Heisey Memorial, Great Falls, Montana
Headquarters—Rainbow Hotel

OFFICIAL CALL

TO THE MEMBERS OF THE
MONTANA MEDICAL ASSOCIATION:

The Great Falls meeting will be unique—ours will afford you a chance to hear many of our own members and guest speakers of high caliber; that of the Pacific Northwest, which immediately follows, is unusually attractive.

As the subjects to be presented are practical, we are sure you will find them valuable and that you can well afford to attend for the sake of the programs alone. Also, it is important for you to get in touch with your confrères at this time, to contribute your views and to hear theirs on the many medical and social problems that now confront us.

Please "make" this meeting.

Fraternally yours,

JOHN A. EVERT, M.D.,

President

THOS. L. HAWKINS, M.D.,

Secretary-Treasurer

"The Most Friendly Meeting You Ever Attended"

PROGRAM

Tuesday Afternoon, July 13, 1937

- 1:30 P.M. Address of Welcome, Hon. Julius J. Wuerthner, Mayor of Great Falls.
- 1:40 P.M. Presidential Address, Dr. John A. Evert, Glendive, Mont.
- 2:00 P.M. Treatment of Uterine Myomas, Dr. Henry Schmitz, Chicago, Illinois.
- 3:00 P.M. Conservative Renal Surgery, Dr. Roland G. Scherer, Bozeman, Mont.
- 3:45 P.M. Fractures of Os Calcis, Dr. R. B. Richardson, Great Falls Clinic, Great Falls, Mont.

Wednesday Morning, July 14, 1937

- 9:00 A. M. Fluid Intake in Edematous Patients, Dr. F. R. Schemm, Great Falls Clinic, Great Falls, Mont.
- 9:50 A. M. Paralysis of the Peripheral Nerves of the Upper Extremity, Dr. J. K. Colman, Murray Hospital Clinic, Butte, Montana.
- 10:50 A. M. Massive Purulent Pericarditis, Dr. Fred F. Attix, Lewistown, Montana.

Wednesday Afternoon, July 14, 1937

- 1:15 P. M. Heart Disease in Middle Life, Dr. J. H. J. Upham, President of American Medical Association, Columbus, Ohio.
- 2:15 P. M. Cancer and Its Treatment With Radium, Dr. H. H. James, F.A.C.S., Murray Hospital Clinic, Butte, Mont.
- 3:00 P. M. Psychosis Associated With the Involutional Period, Dr. Ernest M. Hammes, Professor Nervous and Mental Diseases, University of Minnesota, St. Paul, Minn.
- 4:00 P. M. Nephritis in Children, Dr. Jessie M. Bierman, Director of Child Welfare, State Board of Health, Helena, Montana.
- Annual business meeting and election of officers.

Wednesday Evening, July 14, 1937

- 7:30 P. M. Annual Banquet, Palm Room, Rainbow Hotel.

Addreses by—

Dr. J. H. J. Upham, President of American Medical Association, Columbus, Ohio, *Changing Times in Medicine*. Dr. A. J. Carlson, Professor of Physiology, University of Chicago, Chicago, Illinois, *Black Oxen and Togenburg Goats*.

NOTE: Don't miss this banquet—we promise some real entertainment. Get your tickets when you register.

Cascade County Is Acting as Host to This Meeting

GREAT FALLS COMMITTEE ON ARRANGEMENTS

- Dr. E. Martin Larson General Chairman
- Dr. Faus. P. Silvernale Vice Chairman (General)
- President, Cascade County Medical Society
- Dr. L. L. Howard General Secretary
- Secretary, Cascade County Medical Society

GENERAL COMMITTEE—Dr. E. Martin Larson, Chairman, Dr. J. H. Irwin, Dr. Thos. F. Walker, Dr. L. L. Howard, Dr. Faus. P. Silvernale, Dr. C. J. Bresee, Dr. Charles Little, Dr. F. E. Keenan.

PUBLICITY COMMITTEE—Dr. C. J. Bresee, Chairman, Dr. Clyde Fredrickson.

HOTEL AND TRANSPORTATION COMMITTEE—Dr. F. E. Andrews, Chairman, Dr. R. B. Richardson, Dr. J. C. McGregor, Dr. C. H. Peterson.

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HOST AND ENTERTAINMENT COMMITTEE—Dr. E. D. Hitchcock, Chairman, Dr. F. E. Keenan, Dr. F. R. Schemm, Dr. Thos. F. Walker, Dr. A. L. Gleason, Dr. F. L. McPhail, Dr. E. M. Larson, Dr. Ivan Allred, Dr. J. H. Irwin, Dr. P. E. Logan, Dr. J. C. McGregor.

LADIES' COMMITTEE—Mrs. A. F. Longeway.

SPECIAL NOTE

On the three days following our State Meeting, the Pacific Northwest Medical Association will hold its session in Great Falls. All members of the Montana Medical Association are cordially invited to remain for this meeting.

We suggest that if you expect to attend the latter meeting that you get in touch with Dr. E. M. Larson of this city and obtain a ticket at a reduced rate arranged only for members of our association. If you have not already obtained a program for the Pacific Northwest Medical Meeting, one will be sent you upon request.

Tentative Program of the Pacific Northwest Medical Association Sixteenth Annual Meeting Great Falls, Montana July 15, 16, 17, 1937

PROGRAM

A. J. CARLSON, PH.D.

Professor of Physiology, University of Chicago

1. "Recent Studies in the Motility of the Colon."
2. "The Problem of Control of the Endocrine Glands."
3. "Physiology of the Hypophysis."

VIRGIL S. COUNSELLER, M.D.

Head of Section of General Surgery, Mayo Clinic

Associate Professor of Surgery, University of Minnesota

1. "Classification and Surgical Treatment of Adnexal Tumors."
2. "The Surgical Treatment of Lesions of the Biliary Tract."
3. "The Surgical Management of Congenital Anomalies of the Male and Female Generative Organs."

NORMAN F. MILLER, M.D.

Professor of Obstetrics and Gynecology

University of Michigan

1. "Birth Injuries to the Bladder and Bowel, and Their Management."
2. "The Bloody Complications of Obstetrics."
3. "The Acute Lower Abdomen in the Female."

L. H. NEWBURGH, M.D.

Assistant Professor of Internal Medicine

University of Michigan

1. "The Nature and Treatment of Obesity."
2. "Newer Knowledge of Kidney Diseases."
3. "Some Aspects of the Problem of Diabetes."

H. E. ROBERTSON, M.D.

Head of Section of Pathological Anatomy, Mayo Clinic

Professor of Pathology, Mayo Foundation

1. "Causes and Effects of Various Cirrhoses of the Liver."
2. "The Pathological Features of Hypertension and Coronary Sclerosis."
3. "The Pathology of Tuberculosis."

F. C. RODDA, M.D.

Clinical Professor of Pediatrics, University of Minnesota

1. "Management of the Vomiting Child."
2. "Feeding of Infants."
3. "The Trend in Pediatrics and What to Do About It."

PROCEEDINGS

MINNESOTA ACADEMY OF MEDICINE

Meeting of March 10, 1937

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, March 10th, 1937. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. E. M. Jones.

There were 47 members present.

Minutes of the February meeting were read and approved.

The President called attention to the new screen which Dr. Thomas S. Roberts had presented to the Academy. On behalf of the members, Dr. Jones said he wished to accept this gift and express the very deep appreciation of the members to Dr. Roberts.

The scientific program followed.

PNEUMONIC PATHOLOGY IN THE UPPER LUNG FIELDS

LEWIS M. DANIEL, M.D.

Dr. Lewis M. Daniel, Minneapolis, read his Inaugural Thesis on the above subject.

The purpose of this paper is to present the problem which confronts us in the differentiation of tuberculous and non-tuberculous pulmonary pathology where we have clinically the picture of prolonged or unresolved broncho-pneumonia, and where the evidence from the laboratory and the X-ray is inconclusive. I would like to summarize briefly what has been found to be pertinent in the meager literature on this subject and to review four cases in point which have been under observation during the last year.

In the French literature considerable attention has been given to the transitory shadows of pulmonary consolidation which, although they are short-lived, present about the same initial problem in diagnosis. Jeanneret and Fame, in "Revue de la Tuberculose" December 1933¹, discussing the subject of fugacious X-ray shadows, cite several cases in which the differential diagnosis between tuberculosis and influenzal broncho-pneumonia could be made only by studying the manner of resolution as shown in serial X-rays. At the outset this type of shadow, which they describe as an "Ombre radiologique

fugace," resembles tuberculous pneumonia. The absence or mildness of symptoms and the disappearance often in as short a period as one week decides the question, but many people, according to the writers, have been and are being institutionalized for months on the evidence of a single X-ray.

Cain, Oury, et Barnaud, in the Bull. et Mém. de la Société médicale des Hôpitaux de Paris (1932)^{2,3} cited cases in which the mode of onset and early symptoms made them hesitate between the diagnosis of tuberculous pneumonia and a mild bronchopneumonia. X-ray evidence distinctly favored tuberculosis but a plate taken a month later showed resolution to have taken place to such an extent that their diagnosis was abandoned.

Bernard and Lamy⁴, writing in the same publication in 1933, presented two more such cases in an article entitled "Pneumonies prolongées simulant la tuberculose." In the first case the findings one and one-half months after the onset were still characteristic of tuberculosis but, because of former experience, they refused to make a positive diagnosis. At the end of three months the chest was clear. The second case was almost identical. Both cases were in the upper lung fields.

The French writers on the subject feel that the sudden onset of the acute episode is the most important circumstance which might lead to the diagnosis of a non-tuberculous lesion.

A pertinent article on this subject was written by Dr. R. G. Allison⁵ in 1926. He mentions the struggle of the clinicians and the roentgenologists to arrive as early as possible at a positive diagnosis in chest pathology. An enthusiasm which resulted in many mistakes. He believes that there are many cases in which serial X-rays may reverse the diagnosis favored in the first X-ray and, furthermore, to quote "A critical review of these cases, after the end result has been determined, has given no additional information as to how we may differentiate the tuberculous from the non-tuberculous, at the time of the first examination."

Case 1. A woman of seventy, whose previous examinations had shown evidence of healed tuberculosis, caught a cold. A week later a cough developed and then chills and fever mounting to 103°. She had physical signs characteristic of broncho-pneumonia and was hospitalized. X-ray taken shortly after her admission to the hospital showed consolidation of part of the upper right lobe and it was interpreted as tuberculous. Her leucocyte count never went above 8,000 while she was in the hospital. Sputum examinations were negative. She continued to have a fever of 99.6° to 100° for a month. A second X-ray was taken at that time. The upper right lung showed only the evidence of the old fibrous lesion which had been there before, but a new area of consolidation extending out from the root of the right lung was described. From the X-ray it was impossible to say whether this represented broncho-pneumonia or an extension of tuberculosis. During the next three weeks she was afebrile and improved rapidly in strength so that she was up and around. A final X-ray, taken two months after the first one which had so strongly suggested tuberculosis, showed nothing to support this diagnosis.

F-70	M-50	F-20	M-36
All had positive tuberculin tests			
All had accelerated sedimentation rates at the outset			
All had negative sputa at the outset			
All had acute onset			
Three had chills and fever with temp. of 102°, which gradually subsided over a period of about 1 month.			
Three had moderately severe cough and complained of chest pain.			
Mucopurulent sputum.			
Three showed physical signs of broncho-pneumonia of limited extent.			
Coarse rales.			
W.b.c. 7,200	No rales.	No rales.	Fever for one week.
P.m.n. 83%	W.b.c. 12,000	W.b.c. 17,000	Slight cough. No pain.
	P.m.n. 61%	P.m.n. 4%	Increased bronchial sounds with moist rales.
Tbc. Pneumonia? — in first three cases		Initial X-Ray Evidence	Fibrotic productive with acute infection superimposed.
Resolved broncho-pneumonia.		Final X-Ray Evidence	Old fibrosis—quiescent.
No recent tbc.		Fibroid consolidation tbc.	Same status as before.
No symptoms.		Positive sputum	No trouble.
Activity resumed.		Treatment.	
		? shadow still disappearing.	
		No symptoms or signs.	
		Sedimentation normal.	
		Gain 20 lbs. Working.	

Case 2. The second case is that of a man of fifty, first examined about a year ago because of a digestive upset. At that time it was noted that there was tuberculosis in one member of his family and that he had evidence of an old healed process. He remained well until May 1936, when he contracted an acute respiratory infection. He had chills and fever mounting to 103° at the outset, and considerable prostration. The physical signs in the chest were absent except for a small area of bronchial breathing in the right axilla. The clinical diagnosis was broncho-pneumonia and it was believed to be limited to a very small area. One month later he was entirely free from symptoms. He had had no cough and no fever for about two weeks. From the fluoroscope it appeared that his pneumonia had not resolved. An X-ray taken at the time was suggestive of tuberculosis and the man was sent home to be quiet for a month to see what changes would develop. This observation and rest treatment continued for five months. The patient gained twenty-five pounds and felt better generally than he did before his illness. He has never had any cough or temperature since the acute stage of his illness. There has been no change in his X-ray picture during this period of five months. It seemed as though we might disregard the X-ray picture; but, finally, after repeated attempts to get a satisfactory sputum specimen, we were successful, and found tubercle bacilli.

Case 3. The third case which I wish to summarize is that of a girl of twenty-two, who, after an acute upper respiratory infection which continued for two weeks, was X-rayed and advised that she had tuberculosis and must go to a sanatorium. At that time she had a mild unproductive cough, a temperature which rose to about 100° in the afternoon, and she complained of feeling very tired. She had physical signs of bronchial breathing in small areas in both the right and left upper lung fields. Laboratory findings were negative except for a leucocytosis of 17,000 with 74 per cent p.m.n.'s. (The X-ray plate taken at that time was shown.) Report on this is as follows: "Pneumonic consolidation left upper lobe and base of the right upper lobe. While this lesion has the characteristic appearance of pneumonic tuberculosis, I believe that further plates should be made in a few weeks to determine definitely, etc." After one month of rest at home she was X-rayed. She had gained fifteen pounds and had no cough or fever. The X-ray showed nearly complete resolution of the infiltration of the right lung, but still considerable remaining in the left upper lobe. It was felt that some of the lesion was acute pneumonia which was resolving and it was still impossible to say whether the remaining consolidation was unresolved pneumonia or tuberculosis. In October she felt so well she was allowed to go back to work. Pictures taken at that time still showed some infiltration on the left side, but the right side was practically clear. The roentgenologist felt that the long delay in this resolution would indicate that the lesion was tuberculous. Clinically, this girl is well; no fever, no cough, no fatigue, sedimentation rate normal, hemoglobin 85%, weight 20 pounds more than last winter.

Case 4. One more case before I attempt to comment. This is a man of 36 who was seen last February with what appeared to be post-influenzal bronchitis. He recovered completely in two weeks, or would have perhaps if an X-ray film had not been made of this chest. Diagnosis: moderately advanced fibrotic tuberculosis of productive type with evidence of recent activity. His life and activities were, of course, modified after this but, from that time to the present, there has not been a single symptom or complaint which might be related to tuberculosis. Periodic X-rays have shown no change except that one taken in October was reported as showing a tendency to quiescence and in another examination made in another city in November it was thought that the fibrosis was of no significance at the present time.

In a chart which is represented here, an attempt is made to summarize the findings in these four cases.

This recitation of four related cases of pulmonary pathology is of no importance in the advance of our knowledge in that field except for the fact that it presents the problem of the internist who is not specializing in chest diagnosis, confronted

with contradictory findings, anxious patients and considerable responsibility.

It is safe to say that the acceptance of first X-ray impressions in these cases would have been unfortunate. The roentgenologist suggested subsequent study in his first report.

It must be emphasized that the character of the initial illness did not furnish any satisfactory indication of the ultimate outcome.

My third point is that in these four cases, all observed carefully in the last year, clinical observation and laboratory findings gave better guidance for the ultimate conduct of these cases than did the X-ray findings. However, the X-rays were of course of great value in correlating the clinical conclusions.

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1. René Jeanneret et F. Fame: Apropos des "ombres radiologiques fugaces." *Revue de la Tuberculose*, December 1933.
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3. M. G. Caussade: Apropos des pneumonies prolongées simulant la tuberculose. *Ibid.* May 26th, 1933.
4. MM. Cain, Oury, et Mlle. Barnaud: Pneumococcie pulmonaire aigue curable. Image radiologique simulant la broncho-pneumonie tuberculeuse. *Ibid.* November 4th, 1932.
5. R. G. Allison: Resolution in Pneumonic Consolidations. *American Journal of Roentgenology* 1926.

THIRTY-TWO YEARS OF PATHOLOGY AND SURGERY IN ONE INDIVIDUAL

A. R. COLVIN, M.D.

ST. PAUL, MINN.

This case is shown and reported to call attention to the recuperative power of the human and the possibilities of surgery extending over a period of thirty-two years. Briefly enumerated is a list of conditions and operations.

1. Mastoid suppuration.
2. Opening abscess of jugular vein.
3. Arthrotomy of knee for suppuration.
4. Arthrotomy of shoulder for suppuration.
5. Opening abscess on chest wall.
6. Amputation through thigh for intractable suppuration of knee joint. (Dr. Gilfillan).
7. Repair amputation stump.
8. Cystoscopies.
9. Ureteral calculi removed.
10. Hemorrhoidectomy.
11. Prostatic abscess following urethritis.
12. Osteotomy of femur from deformity following dislocation of hip.
13. Tonsillectomy. (Dr. Warren).
14. Herniotomy. (Dr. Hauser).
15. Fracture of femur.
16. Cholecystectomy for cholecystitis with calculi. (Dr. Hauser).
17. Bursting open of incision for above.
18. Ruptured wound repaired.
19. Repair of abdominal hernia.
20. Thoracoplasty for pulmonary tuberculosis. (Dr. L. Daugherty).
21. Removal of diverticulum of esophagus. (Dr. Greth Gardiner).
22. Open cervical abscess.
23. Tracheotomy for tuberculosis of larynx. (Dr. Gardiner).

Since two years after the beginning of his surgical life, he has worked steadily except for an occasional holiday to have another operation performed. There are some features of his excursions into surgery which seem worth while relating.

The patient is a male, age 50. He was admitted to Ancker Hospital on February 7, 1905, in a delirious state. He had a suppurating shoulder and knee joint and an abscess of his chest wall. These evidently were localized lesions due to pyemia. Further investigation revealed suppurating otitis media, with tenderness over the mastoid process and along the course of the internal jugular vein. On February 9, 1905, the jugular vein was exposed and opened and found to contain pus, the

pus being limited below by proliferating endophlebitis. The mastoid suppuration was dealt with and the sigmoid sinus contained pus which was limited by proliferating endophlebitis above, but was continuous with the pus in the vein below. The suppurating knee and shoulder joints and the abscess in the chest wall were then opened and drained.

While reviewing once more phlebitis, thrombosis, embolism and related conditions, one was impressed again with the importance of keeping in mind the variable nature of infections in their course and consequences, and the manifold reactions of tissues to infections. It was interesting, for instance, to note the swing from Hunter's position that phlebitis is primary to the position of Virchow that thrombosis is the cause of the phlebitis, and the swing back again to the opinion now held that in the great majority of cases the thrombosis is secondary to the phlebitis and that many of the so-called bland thromboses are really due to mild or non-suppurating phlebitis such as occurs in influenza, pneumonia, postoperative, etc.

Phlebitis with consequent thrombosis can in this sense be likened to the various grades of arthritis and, indeed, I shall always remember the patient who came to me after an operation for simple hernia, who, following a postoperative phlebitis, suffered from multiple non-suppurating granulating arthritis from which he was permanently crippled. I opened one of the joints and so demonstrated the granulating character of the arthritis. In another case, following a suppurating tendon sheath infection, there developed multiple abscesses in the calf muscles, with a non-suppurating shoulder and hip joint infection without demonstrable effusion. This patient recovered, with some stiffness of both joints.

I recall a mastoid case in which a diagnosis of lateral sinus phlebitis was made; the upper end of both femurs were involved in suppurative osteomyelitis; the sinus was not opened, and the boy recovered. The sinus thrombosis quite evidently was not of the suppurating kind; the osteomyelitis was.

While reflecting on these and other cases, I was impressed with the infrequency with which the lungs—through which the micro-organisms have to travel to reach the general circulation—are the subject of inflammatory reaction. McEwen, however, in his great work on pyogenic diseases of the brain and spinal cord, divides his cases of sinus infection symptomatically into: (1) pulmonary; (2) enteric or abdominal; and (3) meningeal. I had one patient, a woman, who, after sinus infection due to mastoid disease and operation thereon, developed pneumonia and empyema in the midst of pregnancy and was delivered of a normal child before leaving the hospital. Perhaps sinus phlebitis is recovered from more often than we know. Certainly the non-suppurating kind does.

It is instructive that in this man's case, which we are presenting tonight, the thrombosis was limited by endophlebitis both in the jugular vein and lateral sinus, thus effectually walling off an abscess in a section of the vein.

The diagnosis of his ureteral stones at a time when urethritis complicated the picture and X-ray was poorly developed, was somewhat difficult; he consequently suffered a good deal from pain in the back and left lower abdomen, and thus had a working knowledge of kidney pain. Later he began to complain of "kidney pain" on the opposite or right loin, which, he said, was similar to that he had had before on the left side, and insisted that the right kidney be operated upon. This was, of course, refused and it was not until some time later that I discovered that his hip on the left side was ankylased in a faulty position of flexion of about 35 degrees. An X-ray disclosed a hip dislocated on the dorsum of the ilium. This dislocation was due to the position in which he lay for so long with a suppurating knee. After observing his manner of walking it was seen that with the artificial limb worn with the stump, in a fixed flexed position, each step was practically a contortion of his lumbar spine. It was concluded that his pain was due to a traumatic arthritis or sprain of the spine, and osteotomy through the base of the neck resulted in a corrected position of his stump with complete relief of his lumbar pain; and there has been no recurrence.

Except for the various surgical experiences enumerated, he has remained well and is now again very insistent on going back to work, saying that he feels better than he ever did in his life.

The patient was presented.

Discussion

Dr. WILLIAM DAVIS, St. Paul: I am not going to discuss Dr. Colvin's case from the surgical standpoint, but wish to make one or two philosophical observations that came to me as I listened to the report.

In his lectures on anatomy to our class, Dr. Oliver Wendell Holmes presented a tattooed man who was covered from head to foot with tattooing—figures and animals and devices of all kinds. Dr. Holmes, in commenting on him, very gravely said: "This man is an example of the tortures that man can inflict and that man can endure." To paraphrase Dr. Holmes, this patient of Dr. Colvin is an example of the operations that the surgeon can perform and the patient can endure. I think the patient was extremely fortunate to have fallen into the hands of a man who could follow him through his checkered career and relieve him as he went along. (By the way, the tattooed man turned out to be a fake. His tattoo marks were painted on the skin. This man is not a fake.)

The meeting adjourned.

A. G. SCHULZE, M.D.
Secretary.

NEWS ITEMS

Dr. Thomas F. Walker, of Great Falls, Montana, spoke on "Myelogenous Leukemia" before the Silver Bow County Medical Society on June 1, 1937.

On the basis of a total bond issue of \$5,500 the city of Bowbells, North Dakota, is rebuilding the old school annex into a modern municipal hospital.

Dr. Byron Elmer Crawford, Chamberlain, South Dakota, has moved his office to the Kramer Building in Chamberlain.

Dr. William T. Ferris, formerly associated with Dr. Creighton P. Farnsworth in Chamberlain, South Dakota, now has his own office over Casey's Drug Store in Chamberlain, and is practicing independently.

Dr. Paul F. W. Rick, a graduate of the University of Minnesota School of Medicine in April 1937, has opened offices on the second floor of the Pelovsky Building in LeCenter, Minnesota.

On Thursday, May 6, Dr. James Charles Shields, of St. James Hospital in Butte, Montana, spoke before the Butte Rotary Club on "Some History of Medicine and Surgery."

Mr. George H. Bugenhagen, of Minot, North Dakota, opened bids on May 18 for the new \$40,000 hospital to be erected at Wolf Point, Montana. Mr. Bugenhagen designed the new hospital.

In the June issue of THE JOURNAL-LANCET, an error appeared concerning the identity of the incumbent president of the Montana State Board of Health. Dr. Lewis H. Fligman, of Helena, is the present head of that body.

Dr. Frank Ageton Remde, 36 years old, who was graduated from the Rush Medical College of the University of Chicago in 1933, was slain by an intoxicated patient in Bottineau, North Dakota, on June 17.

Dr. John William Campbell, formerly of Fargo, North Dakota, has located in the suite above the Loe Electric Shop in Hutchinson, Minnesota.

Dr. Arthur F. Sether, formerly with the Civilian Conservation Corps at Grand Rapids, Minnesota, has located in the Oberle Building in Ruthon, Minnesota.

A new 40-pound electric cauterodyne for use in cases of cancer of the breast, has been installed in the Murray Hospital at Butte, Montana.

Dr. John Paul Ritchey, Missoula, Montana, has been accepted as a fellow of the American College of Physicians.

Dr. James Henry Roth, a graduate of the Rush Medical College, Chicago, in 1896, is now a member of the Jamestown Clinic at Jamestown, North Dakota. He had been a physician in Chicago.

Dr. Clarence Albert Butler, of Egan, South Dakota, has returned to Lake Preston to practice. He formerly was mayor of Lake Preston, and president of the Commercial Club, and chairman of the school board.

Dr. Wilfred J. Bushard, of New Ulm, Minnesota, a graduate of the University of Minnesota Medical School in 1936, has located in Bird Island, Minnesota, where he is a visiting member of the staff of Loretta Hospital.

Dr. Charles H. Speir, a graduate of the Wayne University College of Medicine in 1929, and formerly of Shawano, Wisconsin, is the new chief of the Cass Lake, Minnesota, Indian hospital.

Wessington, South Dakota, no longer has a physician. Dr. Wayland Rice, formerly of Wessington, has purchased the practice and equipment of Dr. Frank Elmer Boyd, of Armour, and will locate there.

Dr. Henry Ulrich, professor of medicine in the University of Minnesota Medical School, is the new president of the Hennepin County Medical Society, Minneapolis.

Dr. Benjamin Thane, of Wahpeton, North Dakota, a graduate of the University of Minnesota Medical School in 1917, was electrocuted by his own X-ray machine in Wahpeton while treating a patient on June 17.

Mrs. John Harlan Bridenbaugh, wife of Doctor J. H. Bridenbaugh, of Billings, Montana, is one of the leaders in the Women's Field Army, sponsored by the American Society for the Control of Cancer, in the Billings area.

Dr. John W. Ward, a graduate of the College of Physicians and Surgeons of Keokuk, Iowa, in 1880, and until 1917 a resident of Armour, South Dakota, died at Titusville, Florida, on April 9, according to dispatches. He was buried at Armour on April 15.

Horace Wood, of the North Dakota Farmers' Mutual Aid Corporation, announces that the medical program for resettlement clients ended on June 10. Physicians and hospitals who held unpaid authorizations were urged to present them immediately for payment.

Dr. Fred Wallace Logan, 63, of Blue Earth, Minnesota, died at a Minneapolis hospital in June from heart disease. Dr. Logan was graduated from the University of Iowa College of Medicine in 1901, and came to Blue Earth about 15 years ago.

Dr. John Gartrell Johns, 72, who practiced at Hettinger, North Dakota, since 1907, died there in May. He was graduated from the University of Nashville Department of Medicine in 1897, and came to the Dakotas in the 1880's.

Dr. Edward A. Boyden, professor of anatomy in the University of Minnesota Medical School, Minneapolis, was awarded the gold medal for a scientific exhibit at the 84th annual meeting of the Minnesota State Medical Association. The medal is given by the Southern Minnesota Medical Association.

Dr. Neil S. Dungay, of Carleton College, Northfield, Minnesota, presided at the annual meeting of the north central section of the American Student Health Association at Iowa City, Iowa, in May. Dr. Charles E. Lyght, director of the student health service at Carleton, was a speaker.

Dr. Herman William Froehlich, 57, of Minneapolis, died on June 14 at his home. A graduate of the old Minneapolis College of Physicians and Surgeons in 1905, Dr. Froehlich was in charge of the varicose vein clinic at the Minneapolis General Hospital, and was a trustee of Concordia College in St. Paul.

Dr. Edwin D. Stoddard, 87, formerly of High Forest and Stewartville, Minnesota, died at his home in Beverly Hills, California, recently. Dr. Stoddard came to High Forest in 1875, and to Stewartville in 1890. He was graduated from the Northwestern University Medical School in 1875.

Dr. George Edward, 66, of Canton, Minnesota, a graduate of the University of Minnesota Medical School in 1897, died in Rochester on June 3, 1937. Dr. Edward was a college room mate of the late Dr. Henry S. Plummer, of Rochester, and was a first lieutenant in the U. S. Medical Corps during the World War.

Mr. F. D. Hopkins, executive secretary of the National Tuberculosis Association, advises *THE JOURNAL-LANCET* that the 10th conference of the International Union Against Tuberculosis will be held in Lisbon, Portugal, September 5 to 9, inclusive; under the chairmanship of Professor Lopo de Carvalho.

Dr. Agnes Stucke, Garrison, North Dakota, a graduate of the Women's Medical College of Philadelphia in 1910, was chairman of the joint conference of crippled children and maternal and child health workers at Bismarck on June 12. Dr. Stucke represented the State Medical Advisory Board.

The Silver Bow County Medical Society of Montana met on May 4, 1937, at Butte, Montana, where a paper, "The Reticulo-Endothelial System," written by Dr. Peter Potter, was read by Dr. Harvey Lee Casebeer, of the Murray Clinic. The next meeting will be held on June 1, the guest speaker being Dr. Thomas L. Walker, of Great Falls, on "Myelogenous Leukemia."

Doctor Jean Alonzo Curran, who formerly lived in Cannon Falls, Minnesota, and who took his arts degree from Carleton College at Northfield, Minnesota, has been named dean of the Long Island College of Medicine in Brooklyn, N. Y., according to *The New York*

Times. Doctor Curran was graduated from the Harvard Medical School in 1921.

Doctor J. A. Diamond, of Frederick, South Dakota, has retired from partnership with Doctor R. G. Arveson in Frederick, and will make his home with his son, Doctor Francis Diamond, in Gladstone, Michigan. Doctor Diamond had been in practice for 21 years in Frederick, and was a graduate of the Wisconsin College of Physicians & Surgeons in Milwaukee, Class of 1906.

Dr. Jorgen G. Vigen, of West Los Angeles, California, died at St. Luke's Hospital in Fergus Falls, Minnesota, on May 1st. Dr. Vigen, 73, came to America in 1869; and was graduated from the University of Minnesota Medical School in 1894. He came to Fergus Falls to practice in 1896, where he remained until 1928. That year he went to California.

Dr. Dana C. Rood, now of Duluth, Minnesota, recently inspected the old Rood Hospital in Chisholm, Minnesota, with a view to modernizing it. Dr. Rood has the assurance of the Oliver Iron Mining Company and the Snyder Mining Company that these two firms will cooperate with him in every way possible toward reopening this hospital.

Sixty-six public health nurses convened in Great Falls, Montana, on June first for a two-day conference. Dr. W. F. Cogswell, of Helena, was the presiding officer; and physicians taking part were: Dr. Burton Kane Kilbourne, Helena; Dr. Frank L. Watkins, Great Falls; Dr. Francis Lachlan McPhail, of the Great Falls Clinic; and Dr. Jessie M. Bierman, director of the child welfare division of the Montana State Board of Health, Helena.

At the annual meeting of the Scott-Carver County Medical Society at New Prague on June 15, Dr. Charles F. Cervenka, New Prague, was elected president. The vice-president is Dr. Earl R. Crow, Arlington; the new secretary is Dr. Bror F. Pearson, Shakopee; the delegate is Dr. Milton Boyce Hebeisen, Chaska (Carver); and his alternate is Dr. William Frank Maertz, New Prague. Dr. Herman M. Juergens, Belle Plaine, is censor. The guest speaker was Dr. Frederick Carl Schuldt, of St. Paul.

Dr. E. Martin Larson, Great Falls, was elected president of the Montana Tuberculosis Association at Helena on May 15. Dr. W. E. Pierce, Butte, was re-elected 1st vice president; Mr. J. X. Nenman, Butte, 2nd vice president; and Mr. T. O. Hammond, of Helena, treasurer. Dr. Frank I. Terrill, Galen, Montana, and Dr. Frank L. Watkins, Great Falls, are members of the executive committee.

Nineteen of 21 medical students completing the preliminary course in the University of South Dakota School of Medicine have been placed in 4-year medical colleges, according to Dr. Joseph C. Ohlmacher, dean. Eight will go to Rush Medical College in Chicago, four to Northwestern University Medical School in Chicago, and three to the University of Louisville School of Medicine. Two go to Washington University in St. Louis, one to the University of California, and one to Creighton University in Omaha.

Dr. R. C. Webb, Minneapolis, chief surgeon of the Great Northern Railway Surgeons' Association, of which *THE JOURNAL-LANCET* is the official publication, was guest speaker on "Fractures" at the May meeting of the Seventh District Medical Society at Sioux Falls, South Dakota, on May 11.

Mrs. Stephen Baxter, Minneapolis, was installed as president of the Hennepin County Medical Auxiliary in May; and Mrs. R. R. Cranmer was chosen president-elect of the auxiliary. Mrs. J. A. Watson is first vice president; Mrs. James Johnson is recording secretary; Mrs. W. G. Beckman is corresponding secretary; Mrs. J. P. Hiebert is treasurer; Mrs. E. G. Appen is auditor; and Mrs. C. E. Willcutt is custodian.

The broadcasting schedule (Station WCCO, each Saturday at 9:45 A. M.) of the Minnesota State Medical Association for July is as follows: July 3, "Fourth of July Injuries"; July 10, "Summer Diets"; July 17, "Summer Skin Disorders"; July 24, "Dysentery"; July 31, "Vitamins and the Teeth." Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota Medical School, is the speaker.

The North Central District Medical Association of Montana was organized in May. Dr. Paul O. Neraal, of Cut Bank, became its first president; Dr. Herman Frederick Schrader, of Browning, is vice-president; and Dr. Walter Lynn DuBois, of Conrad, is secretary-treasurer. Delegates to the state medical convention at Butte in July are Dr. Leon John Liest, of Cut Bank; and Dr. Harry W. Powers, of Conrad. The next meeting will be in July in Conrad.

The Cass County Medical Society of North Dakota held its monthly meeting in Fargo on April 26, according to Dr. E. M. Watson, secretary. Dr. A. C. Fortney spoke on "The Treatment of Syphilis;" Dr. W. F. Baillie spoke on "Certain Aspects in the Reporting of Syphilis Cases;" Dr. W. G. Brown discussed "The Medical Follow-up of the Venereal Disease Patient;" Dr. H. J. Skarshaug spoke on "Education in Syphilis;" and Dr. Frank Darrow spoke on "A Discussion of Certain Phases of Syphilis."

The annual meeting of the Advisory Board for Medical Specialties, which is the coordinating board of the twelve certifying boards in the various specialties, the Association of Medical Colleges, the American Hospital Association, the Federation of State Medical Boards of the U. S. A., and the National Board of Medical Examiners was held at Atlantic City, N. J., on June 6, 1937. The following officers were elected: Willard C. Rappleye, M.D., president, New York, N. Y.; W. P. Wherry, M.D., vice-president, Omaha, Neb.; Paul Titus, M.D., secretary-treasurer, Pittsburgh, Pa.; W. B. Lancaster, M.D., Boston, Mass.; and R. C. Buerki, M.D., Madison, Wis., executive committee. Dr. Louis B. Wilson of Rochester, Minn., the retiring president of the board, was elected an emeritus member of the board.

The JOURNAL LANCET

Minneapolis, Minnesota
August, 1937

Vol. LVII, No. 8
New Series

Edwin Lincoln Goss, M.D.

Carrington, North Dakota

President-Elect, North Dakota State Medical Association

Edwin Lincoln Goss, M.D., was born on May 7, 1865, in Grundy County, Illinois. His great grandfather (Goss) was born in Boston in 1760; and his forbears on the maternal (Spillman) side came to Virginia with Captain John Smith.

Dr. Goss attended public school, and then enrolled in the Northern Illinois Normal and Scientific School at Dixon, Illinois, in 1886. He taught three winter terms of school, and entered what was then the College of Physicians and Surgeons (now the University of Illinois College of Medicine) in Chicago in the spring of 1889. He was graduated in 1892, entering practice at Sheffield, Iowa, the same year.

That year, Dr. Goss married Miss Sarah Augusta Vincent, by whom he had two sons, Rollin and Robert Goss. Mrs. Goss died in 1901, and Dr. Goss thereupon moved to Carrington, North Dakota, where he has since practiced. In 1905 he married Miss Nellie S. Standish, by whom he has one daughter.

Dr. Goss entered the Medical Corps of the U. S. Army on April 19, 1918, at Fort Des Moines, Iowa. He was discharged on December 6, 1918, at Camp Devens. He is a Mason and a Shriner.



Transactions of the North Dakota State Medical Association--1937

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* Deceased May 3, 1937.

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* Deceased May 3, 1937.

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G. A. LARSON, M.D., Alternate	Fargo
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* Deceased.

PROCEEDINGS
 of the
 HOUSE OF DELEGATES
 of the
 FIFTIETH ANNUAL MEETING
 of the
 NORTH DAKOTA STATE MEDICAL
 ASSOCIATION
 Sunday, May 16, 1937

The first meeting of the House of Delegates was held at the Dakotah Hotel, Grand Forks, North Dakota and was called to order at 2:00 P. M., by the president, Dr. W. A. Gerrish, Jamestown.

Roll Call

Secretary Skelsey called the roll, and the following delegates, councillors, and officers responded:

Doctors:

A. M. Limburg, Fargo
 J. D. Graham, Devils Lake
 W. C. Fawcett, Starkweather
 P. H. Woutat, Grand Forks
 W. A. Liebeler, Grand Forks
 P. G. E. Hoeper, Williston
 A. R. Sorenson, Minot
 A. L. Cameron, Minot
 A. D. McCannel, Minot
 Will H. Moore, Valley City
 H. A. Brandes, Bismarck
 O. T. Benson, Bismarck
 L. W. Larson, Bismarck
 F. W. Fergusson, Kulm
 A. P. Nachtwey, Dickinson
 A. E. Spear, Dickinson
 R. C. Little, Mayville
 H. Van de Erve, Carrington
 E. L. Goss, Carrington
 J. P. Aylen, Grafton
 C. E. Stackhouse, Bismarck
 Paul H. Burton, Fargo
 Chas. MacLachlan, San Haven
 W. A. Gerrish, Jamestown
 A. W. Skelsey, Fargo
 M. MacGregor, Fargo
 G. F. Drew, Devils Lake
 G. M. Williamson, Grand Forks
 F. L. Wicks, Valley City
 N. O. Ramstad, Bismarck

The president declared a quorum present, and the House duly constituted for the transaction of business.

Dr. Williamson, Grand Forks, made the motion that inasmuch as a vacancy had been created in the Board of Councillors due to the death of Dr. Lee B. Greene, of Edgeley, Dr. N. O. Ramstad be appointed president of the Councillors, and Dr. F. W. Fergusson, be appointed councillor from the Southern District.

The motion was duly put by the president, a roll call being taken on same, which motion was unanimously carried.

Thereafter the president declared that the alternate, Dr. C. H. Sherman, of Oakes, would be the official delegate from the Southern District.

Minutes

Secretary Skelsey moved that the minutes of the Forty-ninth Annual Session as published in THE JOURNAL-LANCET, August, 1936, be adopted, and the reading of the minutes omitted.

The motion was seconded by Dr. A. M. Limburg, of Fargo, and unanimously carried.

Report of the Secretary

Secretary, Dr. A. W. Skelsey, presented the following report:

This session signalizes our Fiftieth Anniversary. As there may be presented a separate and detailed review giving our half century's career, we shall not now relate that history.

For the year ending December 31, 1936, we had 417 members. From January 1, 1937, to date 334 persons have paid their dues.

Committee Meetings: Several joint meetings with various committees were held, especially at Bismarck concerning the Federal Resettlement Administration, and its plans for medical relief to those thousands of families to be cared for under that Administration and local welfare boards.

THE JOURNAL-LANCET has rendered excellent service, in its usual form, and also through the several special editions. In these times of financial depression, the State Association has been fortunate in that a corporation other than our own, has carried this burden of printing a monthly medical journal. You, too, doubtless have noticed the number of formerly nation-wide, high-grade general magazines which have suspended publication. Even now, formerly very staid journals and newspapers have yielded to the apparent necessity of majoring in advertisements, and those often of dubious nature. Nowadays one almost ceases to be surprised on finding in such publications as *Harper's Magazine* advertisements extolling the alleged value of books on birth control, and others on sex affairs freely illustrated—subjects that not so many years ago were taboo in homes and reading circles.

Economics and North Dakota Physicians: It is unnecessary to enlarge upon the nation's plight and the thirty-five billion dollars' national debt. In North Dakota, the several continuous droughts have placed the State in bad shape, so much so that federal, state, and local governments have been providing sustenance and money to the thousands in need of help. Your Committee on Medical Economics will give you their report.

Contract Practice in North Dakota: Through the efforts of the Committee on Medical Economics, agreed rates for reasonable compensation have been secured to some of the doctors, and amicable plans effected between certain counties and physicians. Yet several localities continue the old-time city and county contract practice, plainly indicating a decided lack of unity among medical men. This subject, and also that of contract practice with cheap fraternal orders and lodges for medical and other care, could well bear reviewing and some action thereon.

New Committees: On account of the Federal Social Security Act, and other developments, the following new committees have been created:

- On Crippled Children;
- On Maternal and Child Welfare;
- On Child Welfare.

Proposed Re-Districting of Some County Societies: In compliance with the constitution and the by-laws, several months ago notices were mailed to the councillors and to the local secretaries that this plan might again come before the delegates and the councillors for further action.

Our Two-Year Medical School: This subject was before our last annual session. General reference to this type of schools may be found on page 1540 of the *Journal A. M. A.* for May 1, 1937. Today you will obtain from the Committee on Medical Education latest data on this affair. Apparently the A. M. A. has been straddling the fence. Some of the transactions at the A. M. A. headquarters appear rather peculiar. For several years they have been expending money and time, and awarding their "seal of approval" to bakeries, confectioners, and similar concerns, as recommendations from the A. M. A.'s Committee on Foods. These awards have covered material which now the Association decides shall not hereafter be included in the investigations and awards by said Committee. (*Good Housekeeping* has also been another organization in presenting oval-shaped seals of approval on foods, utensils, etc.) Even if the Federal Pure Foods and Drugs Act is not sufficiently drastic to protect the public, can the A. M. A. rightly be considered another national censor along those lines; in other words, does our own national medical organization have resources enough to adopt, follow up, and at intervals check carefully the various products to which it has already given its approving seal, utilized by donees for advertising purposes?

And now, after having passed along many seals of merit to such concerns and articles, and also having incurred expenses in a field not really belonging to it, the Association has ruled that our medical school possesses not enough merit, money, and

physical equipment to be recognized longer by that Association. Yet it is well known and admitted that practically all of the students from our school have compared very favorably indeed, in scholarship and later professional success, with students from larger and financially better-equipped medical institutions. We admit that our buildings on the Grand Forks campus do not loom large; that we do not have extensive laboratories, as compared with some wealthier colleges; and we also admit that our state financially has been so crippled as to prevent liberal appropriations,—yet for all this, the A. M. A. Council on Medical Education should admit that scholarship and professional success mean much more than elaborate buildings and equipment therefor.

The Society's Constitution and By-laws: We are asked to suggest the possibility of reprinting these. The suggestion comes, NOT from a Democrat of the aggressive Franklin Roosevelt type, with his hobby about the U. S. Constitution, but from one who notices that our document goes back to the year 1919, and because included in its sixteen pages are about four pages devoted to medical defense—which plan of defense was abandoned some years ago. Also, due to the development of serious economic and socialistic tendencies and actual conditions, your Association has deemed it necessary to create committees not existing when the document of 1919 was printed. Our present list of committees now totals twenty, a rather large assignment for North Dakota.

Recent correspondence and a telegram of May 7, 1937, from the A. M. A. might serve some purpose here:

"Recently, certain attorneys considered that the medical defense plan of some medical societies constitutes the unauthorized practice of law; that there was held in Washington, D. C. May, 1937, by the joint committees on professional ethics and grievances on the unauthorized practice of law, discussions covering complaint against the Ohio State Medical Society; that as a result of said conferences a committee has expressed the opinion that the operation of medical defense constitutes the unauthorized practice of law; and that presumably this opinion will apply to other state associations."

We answered headquarters that as we do not carry that form of medical defense, the resolution did not concern us. If, however, our Constitution and by-laws should be reprinted and perhaps amended within the next few years, and the question of medical defense should arise, the above information should be remembered.

Nationally: Health conditions generally have been favorable. However, the whole country has been having forced upon it several decided mass movements *via* the federal, state, and local governments; aided also by the social service uplifters. It appears that the number of highly-strung people waving banners and helping circulate tons of literature of that kind, keeps increasing. Not all of these publicity urges and punches are due entirely to salaried, comfortably-chaired employees clinging fast to governmental jobs; but they are to some extent fostered and aided by some physicians. One doctor interested in this form of noisy campaign explained his attitude and actions by saying that many women have not enough to do, and that the mass-movements will help keep thousands of them busy and therefore out of mischief. However, the question arises whether these ever enlarging mass movements and propaganda urges, while they may relieve the emotional output of those needing employment and so-called self-expression, may not on the other hand, cause undue mental distress and phobias in those whose supposed needs are noisily crusaded by the uplifters *via* publicity talks, radios, magazines, newspapers, etc. If we must have all of this kind of campaigning, why not also freely utilize the large billboards, high protruding rocks, etc., like unto some of the religious sects, which by such devices urge the public at large to be prepared to meet their God. The medical profession seems to be falling into the plan of regimentation.

Syphilis: In connection with some of these movements, it was recently suggested by one of our public health officers that the doctors accept the following plan: free medicine for the syphilitics, not alone for the indigent, but also for the persons well able to pay; also, that the doctors' charge, for such persons

able to pay, not more than \$2.00 or \$2.50 at the most, for each injection. Certainly this is going quite rapidly along the lines of socialized and regimented practice of medicine. But, as the proposed plan is not that of an actual practitioner, the whole affair must be viewed as from the angle of a man, on salaried governmental payroll, passing along the suggestion from the salaried man higher up, who too has a cozy salaried chair, and all traveling expenses paid by the authorities.

A local secretary states that the welfare board in that community believes arrangements may be made whereby those on relief, may be dropped for that case, from the existing contract practice system, so as to take treatments for syphilis at a minimum, say of \$3.00 per treatment. But why make an exception for syphilis in case of those on welfare relief? Why not let all persons on relief, needing medical and obstetrical care, select their individual doctor and the doctors be paid an agreed, reasonable compensation? This should be the system in all counties and towns.

Immunization: The North Dakota State Health Department circularizes all physicians and sends forms for record, notifying them that said department can supply, free of charge, smallpox vaccine and diphtheria toxoid. While not so stated, this could refer only to strictly indigent cases; but in view of the procedures now being urged by various agencies other than the medical profession, physicians should be warned about Fargo's experience in connection with and for some years following the implanting of the Commonwealth Foundation there and the episodes therefrom.

Federal Veterans' Administration: As private practitioners you must be interested in the following data from the February, 1937 *Ohio State Medical Journal* regarding the hospitalization service of the Federal Veterans' Administration:

Approximate percentages of hospital admissions to the Administration's facilities, of patients with non-service-connected disabilities, by years:

Year 1925	17%	The medical journal expresses wonder
" 1926	34%	as to the probable extent of investi-
" 1927	49%	gations made by the Administration
" 1935	88%	of those sworn applications for ad-
		mission.

It might also be noticed here, that the Federal Civil Service Commission reports that as of March 31, 1937, the national government had 829,193 persons on payrolls.

A. M. A. Committee on Foods: After some years' expenditure of time and money, the committee has wisely decided to limit the scope of the foods formerly considered and seals of merit awarded where deemed worthy. Hence, no longer will those seals be awarded to the many dozens of ordinary breads and bakery products, the names of the manufacturers and the brands having been detailed in the various issues of the *Journal of the A. M. A.* These earlier commendations included such seal-bearing products as Quinx-a-Wink Self-Raising Flour, Tar Heel Bread, Angel Food Cake, Buy Jimmie (cocoanut bar), Baby Ruth drops (chocolate flavor), Easy Aces candy, etc. A recent number of the *Journal* carries an advertisement bearing the imprint of both the A. M. A. seal and of the oval-shaped seal of *Good Housekeeping*, which presumably makes assurance doubly sure.

Foundation Studies, Questionnaires, etc. on Medical Affairs: One of the latest publications is that of the American Foundation, created by Bok. It prints the result of its investigations and the post-mortem inquest. Data obtained through circulars to the physicians. There are two volumes entitled *American Medicine*, sold for \$3.50 the set. A lengthy editorial on this publication will be found in the *Journal of the A. M. A.* for May 10, 1937, which deserves your careful perusal.

Care and Relief of Physicians and Their Dependents: The A. M. A. has again considered this subject, which previously had been dismissed in a negative way by it. Its present findings are: (a) that few of the proposed projects for the establishment of clubs or homes, deserve encouragement; (b) that it does not appear to be within the province of that organization to establish homes; (c) that perhaps the formation of an agency in connection with commercial insurance companies to secure

more advantageous contracts and reductions in rates, might operate efficiently.

Special Journals Published by the A. M. A.: the Trustees report a net financial loss in some of the special magazines issued by our national society; intimate that if the deficit continues in those groups of journals, they may suspend publication of those responsible for the larger loss. Even *Hygeia* exceeded its income by a net loss of \$14,791.38. While *Hygeia* is useful to the medical fraternity through its public contact, so far as the other specialized non-profit magazines are concerned, the printing thereof is not only a loss to the A. M. A., but also is in direct competition with regular medical book and publishing concerns, which are doubtless trying hard to get a living.

The Cults and the Irregulars: Throughout many of the states the legislative hoppers have been holding dozens of bills seeking to increase not only the scope of the cults already entrenched by law, but also such composites as sanipractors, naturopaths, etc.

The May 1937 number of *THE JOURNAL-LANCET* gives a record of the N. D. Medical Registration Board and its efforts to control the irregulars and the non-ethical physicians.

The Diplomate for April 1937, contains a valuable address by James Grafton Rogers, master of Timothy Dwight College, Yale University, entitled "The Professions in World Turmoil." While this refers to medicine and law, it could well be applied elsewhere. We hope that we can meet and dispose of these current problems according to our abilities and our resources. Out of all of these conflicts and sufferings, one writer recently made the heartfelt plea that "efforts be made to find some adjustment beneficial alike to the employer, the employee, and the public." All this concerns the physician, his work, and his recompense, mentally and financially. For us who live in North Dakota—an agricultural country and therefore fairly free from distorted textile labor trouble—about all that we are looking for are good crops. May your desires be fulfilled.

Before concluding, I wish to state that Mr. L. M. Cohen, of Minneapolis, was admiring our program. He said he would be glad for his publishing house, the Lancet Publishing Company, to furnish us free of cost the program for each year. He admitted this was an especially nice one and his offer would not include the gold leaf. I thought this matter should be brought to your attention, as it would represent a considerable saving to the Association.

SECRETARY SKELSEY: I have attached to the report the usual statement of annual receipts.

ALBERT W. SKELSEY, M.D.

Secretary

DR. WILLIAMSON: I would move you that you appoint a committee to go over the report of the secretary and bring in recommendations on it.

DR. W. C. FAWCETT, Starkweather: Second the motion. (*Said motion was duly put and unanimously carried.*)

President GERRISH: I will appoint on that committee Drs. Williamson, Fawcett and MacGregor.

Dr. Williamson declined to act, stating that his duties in connection with the host society were too numerous to make it possible for him to serve.

Dr. Charles MacLachlan was named in his stead.

President Gerrish called for the report of the president of the Council.

Dr. N. O. Ramsdahl stated that inasmuch as he had just been appointed as such chairman, a report would be submitted at a later date.

The report of the treasurer, Dr. W. W. Wood, was dispensed with for the time being, owing to the absence of the treasurer.

REPORTS OF COUNCILLORS

First District

Since the last meeting of the North Dakota State Medical Association, the Cass County Medical Society has held seven meetings, with an average attendance of forty-three members.

The total membership at this time is sixty-seven. Five new members have been added during the year, one by transfer

from the Sixth District, and four by formal election to the society. Two members have left the society, having taken up practice elsewhere. There have been no deaths.

The scientific programs have been furnished by members of our own society. A motion picture film was shown and accompanied by a lecture by the Lederle Laboratories of New York City. An obstetrical seminar was held in the early fall.

Various members who attended meetings during the year, outside of our own society, made reports of such meetings before the society from time to time. A symposium on fractures was featured at one session. Syphilis and its relation to public health was discussed at the last session, at which meeting visitors from the State Health Department and from the Fargo Health Department and Cass County Welfare Service, were present. A purely social meeting, at which the wives and friends of the doctors were present, was held in December, 1936.

Subjects of an economic nature came up from time to time. One concerned the relationship of the North Dakota State Medical Association to the Farmers' Mutual Aid Corporation (the Resettlement Administration). What constitutes an emergency under the provisions of the corporation needs clarification and should be clarified at the meeting of the State Council and delegates in order that physicians treating such cases might share in the financial benefits for the care provided.

A fee schedule for the treatment of the indigent cases of syphilis has been worked out by a committee of the society and accepted by the Cass County Welfare Board. It is understood that the fees are to be provided under the Social Security Act. Negotiations for fees for follow-up work in syphilis are still under way.

There has been close contact between the society and the various welfare groups in the community, through committees, throughout the year, particularly with the Cass County Tuberculosis Association. Special work was directed to case-finding of tuberculosis among the teachers of the Fargo schools and in the junior class of the local high school. The society has given its full cooperation in this work.

Medical care of the Cass County poor still remains one of our unsolved problems, so far as the Cass County Medical Society is concerned. The physicians of the rural districts of the county have entered into an agreement with the County Welfare Board to furnish medical care in the various townships at the rate of fifty dollars per township per year. Furthermore, the society continues to be embarrassed by having certain of its members persist in entering into salary contracts with the Welfare Board in violation of the resolutions adopted in good faith prohibiting such contracts.

The society is gradually becoming better organized, and due to the encroachment of socialistic trends, it is evident that greater interest is being taken in all questions touching the profession. In spite, however, of this greater interest and the increasing awareness of the dangers confronting the profession in these swiftly-moving times, under the protective cloak of a paternalistic government, are we to be content in winning peace without victory?

MURDOCH MACGREGOR, M.D.,
Councillor

Second District

The Devils Lake District Medical Society held four meetings during the year, which were all well attended.

We have had no friction in the society and none of the members has taken contract work.

Our April meeting was taken over by the State Committee on Maternal Mortality. Dr. J. H. Moore and Dr. W. E. G. Lancaster gave papers which were considered very valuable.

At the September meeting we had a paper by Dr. J. A. Urner of Minneapolis on obstetrical analgesia. Also, Dr. Kratz gave a paper advocating whole-time district health officers.

We have lost one member by death, and admitted one member, and now have a membership of 28, the same as last year.

G. F. DREW, M.D.,
Councillor

Third District

Regular monthly meetings of the Grand Forks District Medical Society are held from September to May each year.

The attendance is usually good and programs are of a high order.

Good fellowship prevails throughout this district society. Sometimes I think that if it were possible to create some controversy or difference of opinion as to the management of affairs, more fellows might attend the meetings and every man practicing in this district might want to be a member. As it is at present, it is so peaceful and everybody is so happy that the secretary, although I have been unable to secure his report, tells me the men are slow in paying their dues; however, they will pay in time.

We have lost by death two of our older outstanding members: Drs. August Eggers and J. E. Engstad, both pioneers in the practice of medicine. Each had a large circle of friends, and in the early days a very large practice.

G. M. WILLIAMSON, M.D.,
Councillor

Fourth District

The Northwestern District Medical Society was made up of 58 paid-up members for the year 1936. Twelve meetings were held during the year, nine of which were devoted to scientific programs. The three meetings of the summer months were held in the picnic grounds of the Country Club, and were of a social nature and largely attended.

A sincere effort was made to have a worth-while program for each meeting, and the officers of the society made every effort to make the meetings interesting and profitable. The outside speakers brought in were Dr. Wm. White, of the General Hospital, Minneapolis, Minnesota, who spoke on fractures; Dr. G. Alfred Dodds, of San Haven, who spoke on the "Use and Results of Lung Collapse Therapy"; Drs. Freise, Graham and Moore, who spoke on various aspects of obstetrics; Dr. A. C. Kerkhof, of the University of Minnesota, who spoke on "Gastric Malignancy and its Diagnosis by Means of the Gastroscope." The other meetings were addressed by members of the local society, who, in each instance, presented a worth-while subject well-prepared.

All of the meetings of the society have been well-attended, and especially so by out-of-town men. There are a number of men belonging to this district, who are members but never attend any of the meetings; and an effort has been made to reach them and induce them to come, but with little avail.

Seven new members were added to the membership, as follows:

Dr. Paul Ittkin, Tolley
Dr. Tracy Krogstad, Minot
Dr. R. T. O'Neill, Minot
Dr. Kenneth Malvey, Bottineau
Dr. Wm. J. McGee, Flaxton
Dr. Frank A. Remde, Bottineau
Dr. O. W. Johnson, Rugby

Five members were lost to the society through removal from the district, namely, Drs. Russell Gates, Cyrus Owen Hansen, C. W. Robertson, S. J. Hillis, and A. F. Jensen.

During the year of 1936 four doctors were lost through death:

Dr. O. S. Leedahl, Stanley
Dr. J. T. Newlove, Minot
Dr. A. E. Pierce, Minot
Dr. H. A. Owenson, Arnegard

The society also went on record as favoring re-districting of the state, believing that it would create better and more effective district medical societies.

A. R. SORENSON, M.D.,
Councillor

Fifth District

The Sheyenne Valley Medical Society has thirteen members, having lost two during the past year: Dr. H. K. Helseth, Litchville, removed to Minnesota; and Dr. J. M. Nelson, Valley City, located in Montana.

Four meetings have been held, with case reports and autopsy findings being the main topics of discussion. Our aid was extended to the University Medical School. A number of our men visited the Stutsman County Medical Society at various times.

In the Traill-Steele Society territory, there are nine physicians, all belonging to the society, besides one from Grand Forks County.

Three regular meetings have been held, with banquet and program, usually a guest speaker, and talks and discussions by members.

Topics given attention have been "The Status of our North Dakota Medical School"; "Fractures", and "Syphilis."

The fraternal spirit is fine. The society votes its preference to remain as now, against consolidation with another district.

F. L. WICKS, M.D.,
Councillor

Sixth District

During the past year, the Sixth District Medical Society has held four meetings, with an average attendance of 37 members, and a total of 25 guests.

New members admitted to the society during the year are: Drs. A. B. Halliday, Hebron; H. J. Bertheau, Linton; and John A. Cowan, Bismarck.

There are at present in good standing 59 members with their 1937 dues paid. There is one member living outside of North Dakota at present, whose dues have not been paid.

Our programs have been good and interesting. An effort has been made to review important diseases and their treatment, and also to consider the new ideas in medicine and surgery. One meeting was devoted to the consideration of fractures and injuries, the speaker from outside the society being Dr. B. I. Derauf, St. Paul, who discussed "Fractures of the Humerus."

Dr. John A. Urner, Minneapolis, at another meeting, gave us a fine paper on "Analgesia in Obstetrics." One meeting was devoted to "Cancer of the Gastro-Intestinal Tract" under the guidance of the cancer committee.

The members of the society have accepted the plan of the Economics Committee during the past year, and we feel that this plan has been a very helpful and useful one to all concerned.

N. O. RAMSTAD, M.D.,
Councillor

Seventh District

Your councillor begs leave to present the following report for Stutsman County:

We represent twenty-two active and paid-up members as of this date. One physician in the county has as yet failed to pay his dues, so is not included.

We have lost three members during the year: Drs. John F. Regan, C. V. Lawton, and J. C. Fitzpatrick.

One addition: Dr. Pearl Matthaei, who is on the staff of the State Hospital.

Six meetings have been held as follows:

October 1, 1936—Business meeting cleaning up the odds and ends of the state meeting.

December 2, 1936—Address by Dr. Schmidt on "Treatment of Pneumonia and Pernicious Anaemia," with a film on local anesthesia in obstetrics.

January 21, 1937—Film on "Treatment of Hernia," and film on "Episiotomy and Repair with Local Anesthesia."

February 3, 1937—Address by Dr. Harry Fortin, on "Treatment of Fractures."

March 4, 1937—Address by Dr. Orr on "Health and Its Relationship to Maternal and Infant Welfare." Film on "Treatment of Eclampsia" and one on "Examining the Child."

April 23, 1937—Address by Dr. R. E. Pray on "Hyperinsulism"; film on "Rib Resection," "Treatment of Empyema"; film on "Breast Feeding."

Our meetings are always preceded by a dinner, with an average attendance of seventeen per meeting.

Last fall the society purchased a film projector, which has enhanced the attendance and made the meetings more interesting.

Several informal meetings were had with the county and state welfare boards, resulting in a somewhat better understanding. This subject is one which the Executive Committee will have to deal with this fall.

The subject of re-districting the component county or districts was brought up at a recent meeting. There was no discussion following your councillor's presentation. It is my opinion some good will result from a re-grouping in certain areas.

May I bring to the attention of the councillors the question of a revision of the by-laws. The present set was revised about twenty years ago. Most copies are obsolete. New ones should be printed, and all members supplied with the same.

Our society is in good financial standing; harmony prevails; all are interested in their profession and willing to coöperate in every way to alleviate the stress of the present economic situation.

P. G. ARZT, M.D.,
Councillor

Eighth District

The Southern District Medical Society has fourteen paid members for the year 1937.

There are four other doctors in the district who are eligible, but who have not paid their dues.

No doctors have entered the district for practice. Dr. L. B. Greene, Edgeley, was removed by death.

The society held several meetings, with an average attendance.

Dr. Harry Fortin was guest speaker at the May meeting and gave a very instructive paper on "Fractures of the Humerus."

F. W. FERGUSON, M.D.,
Councillor

Ninth District

(In the absence of Dr. John Crawford, Dr. E. L. Goss read the following report:)

During the last fiscal year we have had four regular meetings. We have had no outside speakers. We have had our own members present papers on medical and surgical problems. Much of the time at our medical meetings was taken up with the discussion of medical economics.

This society went on record as favoring the re-districting of the various medical societies of the state.

Our society is on record as against any form of contract practice except as approved by the State Medical Association. Our three counties have no contract doctors, and patients have free choice of doctors.

We have thirteen paid-up members.

JOHN CRAWFORD, M.D.,
Councillor

Tenth District

The Southwestern District Medical Society has lost no members during the year, either by death, removal, non-payment of dues or unethical behavior; but has increased its membership by one, the new member being Dr. Fred Hamernek, government physician at Elbow Woods. This gives us twenty-eight members in good standing.

In spite of adverse conditions, about which you have all probably heard more than we have, I am happy to be able to report one hundred per cent membership for the fourth consecutive year.

We have held five meetings, all of which have been well attended and filled with cheer and good fellowship. At two of these meetings the society entertained as guests the chairman and members of the welfare boards of the several counties which make up the district. We feel that personal contact with these members of the welfare boards is a big advantage, both to them and to the doctors.

We have had as guest speakers during the year, Drs. A. D. McCannel, W. A. Gerrish, W. H. Long, and W. H. Bodensab.

A. E. SPEAR, M.D.,
Councillor

REPORTS OF COMMITTEES

Executive Committee

President GERRISH: Through some humorous quirk of our beloved secretary, he has put me down here as chairman of the Executive Committee, so I will have to give a verbal report.

The Executive Committee met with full attendance, either three or four times in Bismarck, relative to the welfare work, and consummating an agreement with this Farm Co-operative. How poor or how good it is, varies somewhat with your ability as a collector. Some folks report good results, and some say they haven't received any money at all. Personally, in our clinic the bookkeeper informed me the other day that we were about six months in arrears, the whole length of the service. Anyhow, we did the best we could. This thing was organized; they had it incorporated, and they told us to take it or leave it, or they would go on a salary basis and get some men to do it. This is about the extent of our executive committee work.

May we have the report of the Chairman of the Committee on Scientific Program?

Committee on Scientific Program

Dr. A. D. McCannel, Minot, chairman of the Committee, gave the following oral report:

Dr. McCANNEL: I have no particular report to make, other than the program which you have in your hands. I might say that the resolution passed last year stated that the outgoing president was to be the chairman of the Committee.

I started to do the work, but unfortunately in January I had to discontinue it, so turned it over to Dr. Williamson of Grand Forks. I think we should congratulate them on the splendid program they have arranged.

Committee on Public Policy and Legislation

The report was read before the House of Delegates by the chairman, Dr. L. W. Larson, and accepted by the House.

Dr. WILLIAMSON: I think the House of Delegates and the residents of North Dakota owe a great deal to Dr. Larson, and the profession in Bismarck, for what they do during these sessions. Personally I cannot comprehend all of the time and effort they spend for the good of the profession.

I want to move at this time a vote of thanks to Dr. Larson for the efforts he put forth during the last session of the Legislature.

Dr. G. F. Drew seconded the motion, which was duly put and carried.

Report of Committee on Medical Education

Dr. H. E. French, Grand Forks, chairman of the committee, made the following report:

Your Committee on Medical Education would report, in regard to the School of Medicine at the University, that the school was notified in the latter part of October, 1936, that it would no longer be recognized as an acceptable medical school by the Council on Medical Education and Hospitals, this action without prejudice to students at present enrolled.

Appropriations were made by the last session of the legislature that would approximately double the budget that the school has had for the last four years, if it is authorized to continue. Tentative plans are in progress for improvements made possible by the increased budget, and the plans are before the Council to be considered at their meeting in June, 1937.

The committee has nothing to report on popular health education or graduate opportunities for physicians other than what it has reported in other years.

H. E. FRENCH, M.D.,
Chairman

Treasurer's Report

Dr. W. W. Wood, treasurer of the Association, gave his report, which was referred to the councillors for action.

Committee on Hospitals

The chairman, Dr. V. J. LaRose, was not present, and accordingly no report was given.

Committee on Medical History

Dr. WILLIAMSON: On Dr. Skelsey's desk will be some of the histories that Dr. Grassick published. There is a lot of good stuff in it. Many of the young men haven't that history. I believe it would be a good book to have in their library. Dr. Skelsey will have the books on his desk tomorrow and he will tell you the price of them.*

* \$2.25, delivered.

Committee on JOURNAL-LANCET

In the absence of the chairman, Julius O. Arnson, Dr. H. A. Brandes read the report as follows:

We are pleased to give you a report regarding THE JOURNAL-LANCET.

So far as we are able to determine, the situation with THE JOURNAL-LANCET and the publishing house is satisfactory. No adverse criticism of THE JOURNAL-LANCET has come to our attention during the past year.

We do not believe that any change, regarding the attitude of *The Journal of the American Medical Association* toward THE JOURNAL-LANCET, and the articles published in it, has taken place. It is the suggestion of the committee that efforts be continued to re-establish the reputation of THE JOURNAL-LANCET with the American Medical Association, in order that the articles published in it will be recognized and reviewed by *The Journal of the American Medical Association*. Efforts along this line are now being carried out and a supplementary report, regarding this phase of THE JOURNAL-LANCET will be made shortly to the officers of the state society.

Dr. BRANDES: For several years, the A. M. A., on the old plea that we were not carrying ethical advertising, has apparently deliberately refused to abstract anything from our journal. It is very high grade now, and should receive some recognition. I believe that is what Dr. Arnson is referring to.

Committee on Cancer Survey

In the absence of the Chairman, Dr. E. P. Quain, Dr. L. W. Larson read the following report:

Dr. Quain, chairman of your Committee on Cancer, has asked me to prepare and deliver this report. Unfortunately circumstances have made it impossible for him to be very active during the past year, so the committee has not functioned as it would have under his active leadership. However, he does feel that the Committee on Cancer should be continued for several reasons.

One reason is that our medical brethren must be made as cancer-conscious as possible. Symposia, devoted to the subject of cancer, should be continued in the future in our district medical societies.

It is possible that if federal funds are ever appropriated to aid in the fight against cancer, refresher courses in tumor diagnosis can be given in the same manner as those fostered by our State Committee on Maternal Welfare. Early diagnosis and early treatment are still the important weapons in the war on cancer and it behooves us, as practitioners, to keep pace with the subject.

The educational campaigns that have been conducted by the American Society for the Control of Cancer in the past, and are being contemplated for the future, will tend to inform the public as to the early signs, the proper treatment of cancer in general, and the result of recent research. If we are to forestall lay control of a program to decrease the incidence of death from cancer, which has risen from seventh place to second place as a cause of death within the past twenty-five years, we must assume the leadership.

The second reason is that the American Society for the Control of Cancer is organizing a so-called "field army" of women, each member of which will pay a dollar a year for a membership. Seventy cents of each membership fee will be returned to the state organization of the society. It is the plan and hope of the society that the direction of this campaign, and the expenditure of the funds received, will be largely in the control of the organized medical profession. Therefore, it is most important that a state committee on cancer be made permanent.

The society is very anxious that an educational program, preferably over the radio, be fostered. We believe that the State

Medical Association should authorize its Committee on Cancer to assist the Society for the Control of Cancer in this efficient means of disseminating knowledge. There is no reason why it cannot be conducted on an ethical basis, and there are many reasons why the medical profession should be publicly identified with such a program. We feel that this subject should be discussed frankly by the House of Delegates and some decision arrived at for the future guidance of the Committee on Cancer.

Report of Committee on Military Affairs

Dr. L. B. Greene, chairman of the committee, died on May 3, 1937. Neither of the two remaining members of the committee was present; accordingly, no report was presented.

President Gerrish called for the report of the Committee on Tuberculosis. The chairman, Dr. Charles MacLachlan, made the following remarks:

Dr. MAC LACHLAN: We have had difficulty in getting the members of this committee together. I realize that the meetings have been called for the State Sanatorium which is situated near the margin of the state, so it has been difficult for the men, who are spread all over the state, to get away in sufficient numbers to constitute a quorum. A large committee was asked for last year by two members of the committee, when we met in Jamestown, on account of a feeling, which I agree with in principle, that the committee should be large, so that every section of the state would be included, but that appeared practically impossible.

I opposed it because it appeared to me to be impossible to get so many members together at San Haven. We had already experienced difficulty. But they still clung to the idea that as many men as possible from different parts of the state should at some time during the year visit the state sanatorium.

While we had last year a committee of five, we had to wait until we got to Jamestown to the state meeting to get that number together.

I propose to the president something that perhaps might be new in parliamentary rules of order: that if we could get a committee of three together, in which are a membership constituting perhaps nine or ten, that we might make a rule of our own. They would constitute a majority, or at least a quorum of that committee. He did not think that was quite according to Robert's *Rules of Order*. However, I still maintain that any committee, or the majority of any committee, may make its own rules as to the number that would constitute a quorum.

Our invitations perhaps came out a little late. I grant that; but we have been so busy in the past year up there and it was a long winter and the roads were impassable the greater part of the winter, so I thought perhaps we could get them on their way to the meeting at Grand Forks; and make a date as of yesterday for the members of the committee, not all of whom are on the program as printed. I received notices that it would be impossible for this one and that one to be present, so when yesterday came, the president had agreed to come—he is a member of every committee—and we were mighty glad to have him come to San Haven. Dr. Paul Rowe came over, all the way from Minot, to attend the meeting; so it happened that only he, the president and myself were there, so according to Dr. Gerrish's ruling, we didn't have a meeting; however, Paul and I prepared a report, and we have his signature to the report so far as it has been prepared.

Now Mr. President, I would like to have all of the members of this committee who are present come to Room 320 in this hotel as soon as this meeting is over, in order that we may continue our work.

Unfortunately the names of the members of the committee are not all on your program. They are Drs. MacLachlan, Arnsen, Williams, Woodward, Pray, Roan, Rowe, Glaspel, Tooney, and Long. I believe I have mentioned them all and as many of you as are present, I would like to have you meet up there and we will continue our work. We have a partly prepared report.

Mr. President, we will report at a later time, after we have the committee meeting.

President GERRISH: I don't know all about this Robert's *Rules of Order*; but it strikes me that in order to establish this rule of three, you have to get a quorum together first.

May we have the report of the Committee on Fractures?

Committee on Fractures

Dr. A. L. Cameron, Minot, chairman of the committee, gave the following verbal report:

The efforts and work of this committee have consisted in using its influence through correspondence with different members, and through the president, Dr. Gerrish, to arrange with the program committee to have an outstanding speaker on the state program on the subject of Fractures, and to that end, arrangements were made whereby one of our leading members of the State Medical Society, qualified on fractures, Dr. Waldschmidt, of Bismarck, was placed on the program. I think that was a very happy beginning of the efforts of the fracture committee.

I might say here, as you well know, that the American College of Surgeons has been very active in furthering the better treatment of fractures, through the organization of the entire country and has made units, and has appointed chairmen in each of the states, to carry on the propaganda of the College of Surgeons.

Here in this state the effort has been made to have an active member of the College of Surgeons committee in each district society, and each component society, who himself would serve as a medium through whom the propaganda of the College of Surgeons would be furthered.

We have had the organization functioning in this state for two years, and as you will note, the reports of the councillors indicate that this work has been carried on very well; that in most every instance there has been one meeting of the society during the year devoted to the subject of fractures, and usually that meeting has been very worth-while, and particularly in these instances where outside speakers have been obtained.

The question arises in my mind, and I just offer it as a suggestion—I don't know whether or not it would be termed a suggestion—that is whether or not it would not be better to have rather than two committees functioning in this state, (one representing the College of Surgeons and one representing the state organization) whether it wouldn't be much better to combine those committees? It could be done very well without changing the personnel of the committees.

Committee on Medical Economics

Dr. H. A. Brandes, chairman of the committee, gave the following report:

Adverse farming conditions over a period of several years, made worse by the disastrous drought of 1936, brought additional problems to the committee during the year.

It became evident early in the summer of last year that a tremendous demand for assistance would be made upon relief agencies by our farm population, because of the total loss of crops over the greater part of the state. This presented a serious problem with winter ahead and relief funds being rapidly depleted.

The State Public Welfare Board in August, 1936 informed us that we could no longer expect them to furnish medical attention to WPA and Resettlement clients as had been done in the past, owing to the increasing demands upon the County Welfare Boards and the lack of funds.

Medical Relief Under Resettlement Administration

This created for us a serious problem which required immediate action to provide a satisfactory plan to meet the needs for medical care to farmers on Resettlement rolls.

About this time, the Resettlement Administration recognized the need for providing medical aid to their clients and sent their medical director, Dr. R. C. Williams, to the state to survey the situation and to confer with the State Medical Association.

Our first meeting with Dr. Williams took place the latter part of August, 1936. He was much interested in the plan then in effect with county welfare boards, and asked for a copy of our relief plan and fee schedule. In October the state execu-

tive committee and the Committee on Medical Economics held two meetings with him and out of these conferences the present set-up with the North Dakota Farmers' Mutual Aid Corporation was formulated.

The Resettlement Administration accepted, without change, the relief plan and fee schedule which we had submitted. Briefly, the plan and schedule of fees are the same as we had in force with the county welfare boards, and limits medical care to acute and emergent conditions.

Early in our negotiations, we learned that the act under which the Resettlement Administration was created made no provision for medical care and, therefore, no federal money was available for payment of fees directly to the physician. There were two ways open to secure funds—the first, through additional or supplemental grants to the client and the physician collects his fees from the client; and second, through a coöperative agency set up by the Resettlement Administration.

It was not possible for us to secure the same arrangement for the payment of medical bills as we had with the F. E. R. A., and such as exists with the county welfare boards.

Realizing it was necessary for us to take immediate steps to obtain federal funds to provide treatment for Resettlement clients, and to give assistance to our physicians, especially in the smaller communities, we decided to deal with a coöperative agency rather than with the individual client.

We felt that under the conditions that exist in the practice of medicine in our state, and the present attitude of some of our farmers, the physician might find it difficult to collect from the relief client. Under the present arrangement, the physician knows that when he treats a client he will be paid for his services on an agreed schedule of fees, and that he will have no collection expense.

Your committee was not unmindful of the inherent dangers of dealing with a medical coöperative when it recommended to the executive committee the adoption of the understanding or agreement submitted by the Resettlement Administration. Under the conditions that confronted us last fall, it was imperative to act quickly and to accept the best plan that it was possible for us to obtain, and in so doing we hope we have not advanced the cause of state or socialized medicine.

It is true the articles of incorporation of the North Dakota Farmers' Mutual Aid Corporation are drafted along broad lines, and if carried out, would prove vicious and far-reaching in their effect on the practice of medicine. This is unfortunate because we have been assured that it is not the intention of the Resettlement Administration to exercise the powers granted in the articles of incorporation. As we see it, the Corporation was formed to comply with the regulations of the Resettlement Administration for the purpose of getting federal funds into our state to provide medical care to the large farm population on relief.

There is the remote possibility that the Corporation may continue to operate after federal funds are withdrawn but this is not likely to happen, because experiences with similar coöperatives or mutual aid societies in our state have shown that they do not survive, because our farmers do not support them.

The understanding with the North Dakota Farmers' Mutual Aid Corporation was subscribed to by the executive committee on October 19, 1936. The agreement expires at the end of one year.

Since October of last year, bills for medical care, which includes hospitalization, drugs, dental care, etc., totaling \$204,000 have been allowed, and of this sum \$76,000 had been paid.

There has been some delay in mailing out the checks from the offices of the Resettlement Administration due to shortage of help, but this has been overcome during the past week, and we have been promised that the physicians will receive their checks more promptly in the future.

Dr. W. H. Bodensstab, who was appointed medical supervisor for the Corporation under the recommendation of the executive committee, deserves much credit for maintaining the fine spirit of coöperation and understanding that exists between the officials of the Resettlement Administration and organized medicine in our state. His duties at times are not pleasant, and he is en-

titled to our support in his efforts to keep our profession from being placed in an unfavorable light.

We do not wish to leave the impression that it is only the physician who takes advantage of a medical relief program. During the past four years we have encountered very few instances where physicians have been guilty of "chiseling."

We know, as do the relief agencies, that too many patients succeed in getting on relief rolls for the sole purpose of obtaining medical attention at reduced rates. This practice on the part of our patients is to be condemned. The relief officials find it very difficult to prevent this abuse of the medical relief set-up.

During the year there has been a splendid spirit of coöperation and understanding with the State Public Welfare Board and many of the county welfare boards. This has done much to keep our relief program in force. We are especially appreciative of the many courtesies that have been extended us during the year by the members and executive secretary of the Public Welfare Board.

So far as we can learn, there are twelve counties in the state employing a county physician. This is about the same number as reported at the last annual meeting.

Mr. Lyman Baker, of the Public Welfare Board, furnished us with some statistics which should be of interest to the profession. During the calendar year of 1936, the Public Welfare Board of North Dakota expended for medical aid \$848,829, and of this sum \$367,798 was paid to physicians. According to the figures, relief expenditures for 1936 totaled \$2,490,718, and 34 per cent of this sum was spent for medical care. These figures do not include the cost of relief furnished by other relief agencies, or medical treatment provided by the Resettlement Administration.

Activities Under the Social Security Act: The various health activities provided for under the Social Security Act have been organized and are now functioning in our state.

The public health and maternal and child welfare activities are under the direction of Dr. Maysil Williams, state health officer, and the crippled children and blind programs are under the supervision of the Public Welfare Board. We would call your attention to the reports of the chairman of the standing committees on these various activities.

Northwest Medical Conference: The chairman of this committee attended the meeting of the Northwest Medical Conference held in Chicago on February 14th of this year. In attendance at this meeting were more than one hundred and fifty physicians from the middle western and central states.

Dr. McCannel was scheduled to speak on the subject of "Medical Care in North Dakota under the Resettlement Administration," but owing to illness the assignment was taken over by your chairman.

The morning session was given over to a symposium for postgraduate work. A number of state medical associations are now providing postgraduate and refresher courses for their members. I believe this association should take steps immediately to interest itself in this field. The afternoon session was devoted to a discussion on medical economics.

It was my impression there is not a state in the Middle West that has a medical relief program that compares favorably with the one in North Dakota.

Except for taxes and death, no one knows what the future has in store for us. However, it seems that a halt must be called to relief spending in the very near future, and when that time comes we in the medical profession must be willing to coöperate with relief officials to bring about a satisfactory solution to our economic and social problems.

The chairman wishes to express his sincere thanks to the members of the committee for their work during the year and especially is he deeply appreciative of the assistance given by Drs. McCannel and Long in accepting assignments to address component societies on relief activities.

The committee wishes to thank Doctor Gerrish and the members of the executive committee for the coöperation and assistance given during the year.

The expenses of the committee were \$132.77. All bills have been paid by the chairman. Attached hereto is an itemized list of expenditures.

Committee on Maternal and Child Welfare

Dr. J. H. Moore, chairman, read the following report:

In this meeting at Grand Forks, May 16-18, 1937, the North Dakota Committee on Maternal Welfare and Child Health, begs to submit the following report of its activities.

Following the decision of the North Dakota State Medical Association at its Jamestown (1936) meeting, that this committee be made a standing committee of the North Dakota State Medical Association, and that it include "Child Health" in its title and activities, President Gerrish re-appointed the original committee to function during the fiscal year.

Your committee would like to quote from a portion of its report made to the House of Delegates at Jamestown last year:

"It is obvious that your state committee can function best only as a directing agency and as a clearing house, and that the most effective work will be done by the district societies, working in coöperation with your state committee."

Our recommendations, in detail, were published in the proceedings of the House of Delegates and are to be found in THE JOURNAL-LANCET, New Series, Vol. LVI, No. 8, page 422, August, 1936.

In line with this recommendation, your committee proceeded to arrange its first obstetric seminars or refresher courses, with the district committees on maternal welfare and child health directly responsible for each seminar in all of the district societies visited.

After securing authorization from the North Dakota State Department of Health, which authorization included the assurance that funds would be supplied from social security monies available for this purpose, your committee selected Doctor John Urner, associate professor of obstetrics and gynecology in the University of Minnesota, as clinician, and began the task of arranging his schedule with the various district committees. These seminars were conducted by Dr. Urner in Grand Forks, Grafton, Devils Lake, Fargo and Bismarck, September 15 to 22, 1936 inclusive.

No two district maternal welfare committees followed exactly the same plan in conducting the seminars. After the seminars were held, a letter was sent to each participating district medical society asking for a report from the local maternal welfare committee and inviting criticisms and suggestions. Reports were received from all and a complete report was filed with the state health officer for forwarding to the Children's Bureau at Washington. This complete report makes interesting reading but, consisting as it does of some seven typewritten pages, is too lengthy for the records of this meeting. Your committee has the entire report in its files and would be glad to furnish it to any delegate interested. Excerpts from it are as follows:

1. "Dr. Urner chose five different obstetrical subjects, namely: 'Toxemias of Pregnancy,' 'Obstetrical Hemorrhage,' 'Prenatal Care,' 'Breast Feeding' and the 'Management of Abortions.' All five subjects were exceedingly useful, and were well-received by the members attending. The whole series acted as a refresher course to the men who were fortunate enough to attend.

2. "All the sessions were unique in the large number of questions asked, and the length of discussion that followed each paper. The consensus among the medical men seemed to be that this was one of the most outstanding meetings ever held here. The only suggestion would be, if possible, to have perhaps two clinicians conduct such a seminar. This would tend to make such seminars even more interesting. In our estimation, the seminar was a decided success.

3. "Our plan of meeting was to follow the obstetrical case through to delivery, showing both the normal case and the complications which must be considered. Topics presented were handled by the local committee, and consisted of prenatal care, toxemias of pregnancy, early hemorrhages of pregnancy, late hemorrhages of pregnancy, and post-delivery care of the infant. Cases were presented from the case histories, following which Dr. Urner presented discussions of the topic. If there

were to be any criticism made of this meeting, it would seem that it is rather difficult for one speaker, no matter how capable he is, to preside at meetings conducted over two days' time. I would suggest that if we were to conduct another seminar, we ask the pediatricians to join us.

4. "The meetings were conducted on a very informal basis, which we feel encourages discussion and we feel that this result was thoroughly achieved. Our general plan was for one of the local committee members to present a subject in a rather brief manner. Following the presentation of the topic, it was discussed by the attending physicians and was closed by Doctor Urner. The attendance varied considerably. The first forenoon there were fifteen men present. There were thirty-five at the afternoon sessions. Most of the men came from a considerable distance, going home at night and returning for the following day, which we felt was indicative of their interest and enthusiasm. Although the attendance was not so marked, we were pleased with the type of physician who manifested an interest in these meetings; that is, the men in the larger towns who do very little or no obstetrics were not in attendance, but the men in the rural communities who do considerable obstetrics were present and were highly interested."

Your committee has given you these excerpts from the reports of the several district committees to emphasize that we believe this form of postgraduate instruction in obstetrics is decidedly worth-while. They indicate how the different societies arranged the seminars to suit their particular desires or needs and such individuality is to be encouraged. We believe that the effective work of the various district committees should be encouraged.

Interest in this form of postgraduate instruction is high, and your committee has received requests for seminars from districts not yet visited. Whether or not additional seminars can be presented depends largely upon the availability of funds. We are at present attempting to work out plans for seminars in at least three cities of the state in the very near future.

In concluding our report to you at the Jamestown meeting we stated, "Your committee has not had time to contact all the district societies of the state." Nor have we yet had time to make the personal visitations which our original program called for. Since the last annual meeting, your committee has presented an obstetric program before the District Society at Minot on October 29, 1936, and three members of the committee appeared on the program.

The work of your state committee would be greatly facilitated if each district society would appoint a district committee on maternal welfare and child health. We strongly recommend that such be done and that such committees: (1) Sponsor obstetrical programs in their own societies at stated intervals; (2) increase case reports in obstetrics by the members; (3) foster educational work among lay organizations such as Federated Women's Clubs, Parent-Teachers' organizations and Home-Makers Clubs, and (4) arrange for obstetric seminars or refresher courses as a part of a program of postgraduate instruction in obstetrics for its own members. To all of these undertakings your state committee would be glad to lend the fullest possible degree of coöperation.

In addition to eight radio talks, dealing with obstetric subjects, your committee now has available radio talks on "New-born" and "Infant Feeding."

We have actively coöperated with the American Committee on Maternal Welfare, Inc., and have contributed material for publication under the auspices of the American Committee in the Department of Maternal Welfare of *The American Journal of Obstetrics and Gynecology*. The last article, dealing with the plans of your state committee, is published in the April, 1937, issue of the above *Journal*.

There has been an increasing amount of correspondence and secretarial work necessary to carry on the very limited work of your committee thus far, and the expense of this has, to date, been borne privately. Coupled with this, the members of the committee have been put to considerable personal expense in furthering the work of the committee. It is recommended to

the state association that an appropriation be made to cover the actual expenses of the committee.

It is further recommended that the personnel of the North Dakota Committee on Maternal Welfare and Child Health be increased to include one or more pediatricians, so that the child health phase of the committee's work can be given proper emphasis.

A very important field of lay education can be developed if the various local committees on maternal welfare and child health will furnish speakers to talk on maternal welfare and child health problems as requested. An example of this is to be found in the manner in which members of your state committee have coöperated with several American Legion Auxiliary Posts during the past year in celebrating Mother's Day. There are many other organizations, as indicative above, which would welcome informative talks on these subjects by members of the medical profession.

Dr. McCANNEL: Carrying out the suggestion of Doctor Moore, I think it would probably be a good thing to combine the Committees on Maternal and Child Welfare, and Child Welfare—the two committees would dovetail.

President GERRISH: We have had a lot of correspondence with these two committees. We weren't able to figure out where one ends and the other begins. We never were able to decide why we had the two committees.

Dr. McCANNEL: We were trying to follow the provisions of the Social Security Act. These both come under the Departments of Health.

Dr. WILLIAMSON: I move you that you appoint a committee, with Dr. McCannel as chairman, to get all these things straightened out.

Dr. McCANNEL: I was just making a suggestion.

Dr. MOORE: I am mighty proud of this committee on Maternal Welfare. These boys worked, and I will put the record of that committee up against any other committee, unless it is Dr. Brandes' committee. However, don't make that committee too large, or we can't get them to work.

President GERRISH: Personally, I have always been opposed to large committees. They are cumbersome and almost impossible to work with. As Dr. MacLachlan says, three is about the limit of the quorum.

Dr. WILLIAMSON: I move that the chairman appoint a committee on committees, with Dr. McCannel as chairman of that committee, and get a couple of other fellows familiar with the procedures. Consolidate them; appoint a committee of three.

Dr. BRANDES: Second the motion. (*Motion duly put and unanimously carried.*)

Dr. GRAHAM, Devil's Lake: I think that at this time before we are through with committee reports, some discussion ought to be made with regard to Dr. Brandes' report, especially in regard to the part dealing with the North Dakota Mutual Aid Coöperative.

(Drs. Graham, McCannel, Long, Drew, Brandes, Fawcett, Matthaei, R. C. Little and Ramstad informally entered into the discussion.)

President GERRISH: On the Auditing Committee, I would like to appoint Drs. Drew, Sorenson and Wick.

Dr. WILLIAMSON: Mr. President, I want to introduce Dr. Grassick. (*Prolonged applause.*)

President GERRISH: Dr. McCannel made the suggestion that a medical man should be appointed on the State Welfare Board. If this meets with your approval, I will give it to the Legislative Committee for action to decide. (*No dissenting voice.*)

Dr. Ramstad, have you a report on the re-districting committee?

Dr. RAMSTAD: Not at the present time. The councillors have not met yet. We shall be glad to give you a complete report afterwards.

President GERRISH: At the last annual meeting we had a resolution on birth control that was tabled because of the publicity it would bring about. It is the so-called Cass County resolution. Do you have the resolution as it was read? It was discussed quite thoroughly at the last meeting, and we put it

on the table until today.

Dr. A. P. NACHTWEY: I move that we postpone it for another year, due to the fact the A. M. A. (year 1936) had tabled it for another year.

President GERRISH: Why not postpone it indefinitely?

Dr. NACHTWEY: All right; I will so amend my motion.

Dr. LIMBURG: Second the motion. (*The motion was duly put and unanimously carried.*)

President GERRISH: Anything on the table, Mr. Secretary?

Secretary SKELSEY: There is a letter from the North Dakota Pharmaceutical Association I received just yesterday, suggesting affiliation with our society. I may say in this connection that about a year ago the public relations committee entered into an agreement with the Greater North Dakota Federation and allied associations, looking to unity of interests. It was agreed that our society would pay \$25 a year. I am sorry Dr. L. W. Larson is not here, because he spoke about working with the Greater North Dakota Federation. (*Reads letter from state secretary of the N. D. Pharmaceutical Association.*)

Dr. A. P. NACHTWEY: I make a motion that it be referred to the executive committee for action, and reported to the next meeting of the House of Delegates.

Dr. BENSON: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: Another thing I would like to bring up. It seems there will be considerable amount of federal money brought into the state for the care of syphilis. I don't understand the exact set-up. I think we should have a temporary committee appointed to report during the meeting this year. There is going to be brought into the state, as I said, considerable money, and I believe we should get an idea of what we should do. I would entertain a motion for the appointment of such a committee.

Dr. FAWCETT: I move that the chair appoint a committee of three.

Dr. NACHTWEY: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: I will place on that committee Drs. Larson, Graham and Bowen.

President GERRISH: Another thing that I think should come up, is the matter of having the Constitution and by-laws brought up-to-date and reprinted. We have not had a new edition for many years. They are very incomplete. What would be your pleasure?

Dr. E. L. GOSS, Carrington: I move that they be reprinted.

Dr. NACHTWEY: Second the motion. I think the committee should be appointed with Dr. Williamson as chairman.

Dr. FAWCETT: It was drawn up in 1919. I happened to be one of the committee at the time. Doctor Williamson knows more about it than any other man in the state. I think a committee of three should be appointed with Dr. Williamson as chairman, so I move that a committee of three be appointed, with authority to act.

President GERRISH: If they are revised, they would have to bring it up on notice for a year or so.

Dr. FAWCETT: It will take a great deal of time to do that, and if that committee were appointed now, it would be in shape to make a report a year from now.

President GERRISH: You may correct the Constitution and take out things that are dead. That is not a revision of the Constitution. It doesn't have to be acted on by the Association. They are not going to make a new Constitution and by-laws.

Dr. FAWCETT: I think it would be well merely to have them revised by next year; not reprinted.

Dr. AYLEN: In the matter of changing the Constitution, something was called to my attention today which I didn't know before. In the old Constitution, the ex-presidents were *ex officio* officers so to speak, of the House of Delegates and Councillors; but it is omitted from this present one.

President GERRISH: Wasn't that a typographical error?

Dr. AYLEN: It must have been, because most of the ex-presidents thought all the time they were members of the House of Delegates.

Dr. FAWCETT: We are members, all of us ex-presidents; but if it comes to a show-down, we have no vote. We always have voted and got up and talked more than anybody else. It should be so stated, as Dr. Aylen says.

Dr. FAWCETT: I move that a committee be appointed to make such corrections in the Constitution as the committee deems necessary, and be prepared to report at the next annual meeting.

Dr. SPEAR: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: I will put on that committee Drs. Williamson, Fawcett and Spear.

Are there any special committees to report, Mr. Secretary?

Is the Auditing Committee ready with its report?

Secretary SKELSEY: The Auditing Committee, as I understand it, finds the reports of the Treasurer, the Secretary, and the bill presented by the Committee on Medical Economics, correct. The Committee on Medical Economics is allowed a definite sum annually, and it has used a little over half.

Dr. BENSON: Move that the report be accepted.

Dr. VAN DE ERVE: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: You all heard the report of Doctor Cameron, chairman of the Fracture Committee, wherein he suggested that the State Committee on Fractures, and the one representing the College of Surgeons, be combined. What is your pleasure about the Committee on Fractures?

Dr. McCANNEL: I think the suggestion is a good one. The College of Surgeons is doing an outstanding work. Last year to give recognition to the College of Surgeons, I incorporated in the program the entire fracture committee of the state and College of Surgeons.

President GERRISH: I still can't see why we should have only one. Why should we combine—why should we accept their committee as ours, or they accept ours?

Dr. CAMERON: The College of Surgeons have a very definite program which they are trying to institute in this state. I can see no reason why the state organization should not cooperate with them to extent of accepting their committee.

Dr. McCANNEL: Why duplicate the work?

Dr. CAMERON: That is what I say; why not have the state committee put their stamp of approval upon the College of Surgeons' Committee and work in conjunction with them to the extent of arranging programs; that is, scientific programs and exhibits and furthering the propaganda of the College of Surgeons in connection with the care of fractures, as far as the hospital set-up is concerned and all those features, and while the American Medical Association and the State Medical Association are separate and distinct organizations, yet we are all in direct contact with the work of the College of Surgeons, and we are as much in contact with that as we are with the American Medical Association.

President GERRISH: What is the pleasure of this group: shall we combine this committee with that of the American College of Surgeons?

Dr. BENSON: I move that we refer it to the Committee on Committees.

Dr. CAMERON: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: Anything else to come before this meeting?

Dr. WOUTAT: Dr. Moore in his Committee on Maternal and Child Welfare made some suggestions regarding the permanency of that committee.

President GERRISH: That is referred to the Committee on Committees.

Dr. WOUTAT: He made a further recommendation that inasmuch as apparently the Social Security provisions were going to have considerable money poured in here, and prenatal clinics possibly be established, to enable this committee to function accurately, perhaps an appropriation should be made to cover its expenses.

President GERRISH: That would have to go before the Council, where finances are concerned.

We will now entertain a motion to adjourn.

Dr. McCANNEL: I move we adjourn.

Dr. NACHTWEY: Second the motion. (*Motion duly put and unanimously carried.*)

Second Meeting House of Delegates

The adjourned meeting of the House of Delegates was called to order at 12:30 P. M. on May 17, 1937, by President Gerrish.

Secretary Skelsey called the roll, and there being no quorum present, the meeting was adjourned until the completion of the banquet and evening program.

Third Meeting House of Delegates

The adjourned meeting of the House of Delegates was called to order at 11:30 P. M., on May 17, 1937, by President Gerrish.

Secretary Skelsey called the roll and declared a quorum present. The following proceedings were had:

President GERRISH: We have a telegram from the Minnesota State Medical Association, which reads as follows:

"Members of the Minnesota State Medical Association extend greetings to members at this annual meeting, and wish them a bumper crop and medical success.

A. W. ADSON, M.D., *President.*"

Dr. MACGREGOR: Have all of the societies reported this year?

President GERRISH: All except the Southern Society. It is the first time, so far as the annual meeting is concerned, that every one has not reported; that is the annual report. Is Dr. Fergusson here?

Dr. MACGREGOR: Could we have authority to declare their charters vacated, and then let them join another society? I know a lot of fellows that would like to come to Cass and join with us.

President GERRISH: I can't imagine that it is anything like that, that they have in mind. I think it is economic conditions. Even the Grand Forks Society is short one hundred dollars in its remittance; it is twenty members short. Grand Forks usually remits for about sixty, and this year has remitted for only forty-one. I suppose the Southern District is in very bad shape financially.

Dr. WILLIAMSON: I think myself sometimes it is the fault of the officers. I told the fellows this is a great opportunity this year to bring in every man into the society, for the reason it is the Golden Jubilee.

President GERRISH: May we have the rest of the committee reports, please. The committee on syphilis: do you have a report ready?

Dr. L. W. LARSON: The committee wasn't formally appointed; it is merely tentative, but I believe that a committee on venereal disease should be made a permanent committee of this society. It is just a matter of a little time, and there will be a definite program attempted by the State Health Department. Now I believe that you should have a strong committee on venereal disease to confer with the state health officer, and with the doctor who will undoubtedly be the representative of the Health Department in venereal disease, so that many difficulties can be ironed out.

You will remember that when the Cass County delegation or society brought in its report, it showed that that society had had a meeting, and had appointed a committee to arrange for a schedule of fees to be accepted by the Welfare Board of Cass County. Now we find ourselves in the situation of having one schedule of fees in Cass County, another in Burleigh, and another one in Grand Forks. I believe there should be a separate committee on venereal disease to iron out these difficulties.

Dr. Williams tells me that every day they receive letters from doctors out in the territory requesting information. How are we going to carry out the program? Are we going to have some one designated by the state society, or have some one sent in by the federal government? What kind of records shall we keep? These are some of the things to come up in the venereal disease program.

I think the incoming president should be given authority to appoint a committee to act as an advisory committee, with the State Department of Health, on venereal diseases.

President GERRISH: You were the chairman of the committee, whom I appointed. You spoke about federal funds coming in and we made you chairman.

Is the Committee on Committees ready to report?

Committee on Committees

Dr. A. D. McCannel, chairman of the Committee on Committees, made the following report:

I don't know who the other members of the committee are. However, I talked this over with a number of members of the profession, and I beg to make this report. If you will look at the list of the standing committees it will simplify it somewhat. We make the following suggestions:

Leave the executive committee the same as it is; as well as the committee on scientific program and the committee on public policy and legislation.

Eliminate the committee on medical education.

Combine the committee on necrology and medical history.

Eliminate the committee on hospitals. It never functions, anyway.

Leave the editorial committee as it is.

Leave the cancer survey committee as is.

Eliminate the committee on military affairs.

The committee on tuberculosis remains the same.

The committee on fractures: the state society to recognize the College of Surgeons, with the committee on fractures as their spokesman or representative as far as its functions in the state are concerned.

Eliminate the committee on public relations and on early mental diseases.

The medical economics committee is to remain the same.

Have one committee on maternal and child welfare consisting of obstetrics, and a committee on child welfare representing pediatrics.

Also leave the committee on crippled children.

We will also be very glad to add to the list of standing committees the committee on venereal disease as suggested by Dr. Larson.

Dr. WILLIAMSON: Why not combine the two committees on maternal and child welfare?

Dr. McCANNEL: We have.

Dr. FAWCETT: I think it is a great mistake to cut off the committee on medical education. The school is still running. Perhaps we could take it off later; but not right at this time.

Dr. McCANNEL: I move the adoption of this report other than eliminating the committee on medical education.

Dr. SPEAR: Second the motion.

(President Gerrish stated the motion, which was duly put and unanimously carried.)

Dr. L. W. LARSON, chairman Committee on P. P. & L.: If it is in order, I would like to offer this resolution, which has the approval of the majority of the members of the committee; some I have not been able to contact, but I feel confident they would approve. It is as follows:

"Whereas, so many of the problems confronting the State Welfare Board involve the medical care of the indigent sick, and

"Whereas, a medical physician as a member of the Welfare Board could be of inestimable value to the Board in the solution of these problems, and

"Whereas, there is no physician on the Welfare Board at the present time, now therefore,

"Be it resolved, that the House of Delegates of the North Dakota Medical Association in convention assembled in Grand Forks May 16-18, 1937, does hereby petition His Excellency, William Langer, Governor, to appoint a medical physician to the State Welfare Board as soon as the opportunity arises."

Dr. McCANNEL: Second the motion.

Dr. NACHTWEY: This committee has been quite concerned about not having a doctor on the Welfare Board. I would like to ask Dr. McCannel to tell us how important it is to have a doctor on the Board, inasmuch as you have been there for

the last couple of years. What would be the results to the profession if we have no representation?

Dr. McCANNEL: I will be very glad to tell you my impression, being upon the Board.

(The motion was duly put and unanimously carried.)

President Gerrish called for the report of the Re-districting Committee.

Dr. FAWCETT: We thought we had this thing fixed up pretty well at Aberdeen. This re-districting was to be left as it is, with the perfect freedom of the men to join where they wanted. If a doctor wants to remain a member in Cass County, or if he wants to be a member some other place, that is all right. I think the files will show that in 1931 we left it elastic enough; that we don't need to ask any society to quit, or we won't put any society out of business.

Dr. Skelsey read from THE JOURNAL-LANCET for 1931, concerning the re-districting proposition.

Dr. WILLIAMSON: If you would name your councillors on a committee, they could get together and work this thing out.

President GERRISH: I notified the Councillors and the secretaries; but there has been no correspondence upon the practicability of the proposition.

Dr. MACGREGOR: The society south of us hasn't had a meeting this year, and there are a number of doctors there who would like to join our society because their society is not active. Can we take those fellows in? They would like to come into some place where they can attend the meetings.

President GERRISH: Why not have a committee develop a definite specific plan and send it to the different societies and have a vote on it, from the members of the society?

Dr. VAN DE ERVE: Tri-County voted on that proposition, and they decided to join with the different societies of their choice.

President GERRISH: Another way we can do is to let the societies eliminate themselves that way, if they wish.

Dr. MACGREGOR: Can't we eliminate them absolutely, when they don't have meetings or make a report, or their society is not active?

President GERRISH: I presume we could.

Dr. FAWCETT: Going back to the meeting of 1931 in Aberdeen. It explains the whole situation of what we can do and can't do, and that has never been revoked. That is elastic enough so that those down in Richland County can join any society they wish. I don't think we should have any other committee; but should go back to that plan.

President GERRISH: My idea would be this: to let each society decide whether or not it will continue.

Dr. FAWCETT: The trouble that time came up over the Dickinson and Bismarck districts, and according to the minutes of the meeting, in the plan we put over at that time, there was to be no definite line. It was to be a point nearest for the doctor. Each district was to decide who was to have that man. If they wished to stay in the society they belonged to for years, they could have that privilege. I don't see the necessity of going into the thing any more, or any more re-districting. As for the district in Richland County, or the Southern District, if the men say their society is dead, and that they have no society, they can come up to Fargo or Jamestown, if they want to join. If their records are good, let them come in.

Drs. McCannel, Williamson, Wicks and Goss spoke to some extent on the question before the house.

Dr. SHERMAN, of the Southern District: As to the suggestion made by the doctor, down there in our particular instance, it would so weaken our society that it would have to go out of existence. We have certain men in our district who are fairly active now, who would not belong to any district, they would be so far away. An arrangement like that is simply going to wreck our society, so we won't have any. If it lets men in the northern part of our district join some other district, it leaves so few of us down along the border that it wouldn't be worthwhile. If you make such a revision as this, you will not have any members in your society or anything else.

President GERRISH: What is your pleasure about this re-districting?

Dr. MacGREGOR: I make a motion that we table it.

Dr. FAWCETT: Second the motion. (*Motion duly put, and unanimously carried.*)

Dr. MacLACHLAN: I have endeavored to get the committee on tuberculosis, consisting of ten members together to sign this report, and to make any additions or corrections they might see fit. Now I have this committee report signed by three members of the committee. I have called meetings and have been unable to get the members together. This is the report of the tuberculosis committee. If you wish me to get more signatures, I shall endeavor to do so.

President GERRISH: The committee report is accepted.

Report of Committee on Tuberculosis

Dr. MacLachlan, chairman of the aforementioned committee, submitted the following report:

With an application for hospitalization list that at one time during the year, May 1, 1936 to May 1, 1937 numbered 265, and with a list of completed registration patients of about 60 to 65, that was pretty constant and somewhat equally divided as between the sexes, the information department serving by mail was necessarily overworked in replying to inquiries from doctors and patients' families as to when relief might be obtained through admission.

Some relief was obtained through the coöperation of the superintendents of the Minnesota group of county sanatoria, particularly at Sunny Rest, Crookston and at Battle Lake, Minnesota, where between these two alone, as many as fourteen patients registered at San Haven were at one time or other given competent service for months while awaiting admission here; we advised the individual or county, and they entering into the financial contract which would permit this care until opening appeared at San Haven corresponding to patients' registered numbers.

Notwithstanding the fact that infirmary improvements in the original unit had permitted an increase of space for thirty additional patients in the winter of 1936, our list of applicants lengthened; but our hope for real relief had meanwhile been bolstered by joint action of the federal and state governments in providing the funds for the construction and equipment of a third infirmary unit to care for, when furnished, 123 bed patients.

The construction of this unit necessitated increased equipment for power house service, not all of which has yet been provided; but which we anticipate will be ere winter's cold appears.

Unfortunately, however, the last legislature failed to respond to our appeal for increased dormitory accommodation for the fifty or more employés that will be required to care for these 123 bed patients when the new Number Three unit is called upon to maintain its complement of service. This increased employé service consists first, of fifteen nurses, a dietitian, a matron and about thirty diet kitchen and housemaids; the male additions being one doctor and the necessary male nurses, janitors and orderlies.

To house these forty-five females, the present nurses' home will care for the additional nurses; but for dormitory accommodation for the others, we have been obliged to transport to the new unit the sixteen male patients hospitalized in the Masonic Cottage, and remodel it to some extent within to care for a matron, a dietitian and twenty-eight house and dietary maids, while for housing the required extra male help, we were forced to transport eight female bed patients from another cottage to another new unit floor and refit the interior for the changed service.

The institutional service will be greatly improved when the new unit has been furnished with the equipment ordered under contract bids, which include not only beds, bedding and bed-stand furniture in keeping with the general excellence of construction that prevails throughout the building, with its diet kitchens on each of four floors, all reaching by continuous corridors to the electrically-operated elevators that lead to the infirmary's general kitchen, its rotunda solarium on the roof, and its capacious sterilizer and morgue in the sub-basement. Institutional records contain the following facts as to surgery.

May 1, 1935	May 1, 1936
to	to
May 1, 1936	May 1, 1937

CHEST SURGERY

Pneumothorax refills	9,986	10,822
Aspirations	44	91
Phrenic exeresis	7	6
Phreniphraxis	13	17
Scalenotomy	0	1
Thoroscopy	3	3
Intra-pleural pneumolysis	18	11
Rib resection	1	5
Thoracoplasties	21	43

GENERAL SURGERY

Appendectomy	0	6
Cholecystectomy	0	1
Enterostomy	1	0
Abdominal exploratory	2	0
Nephrectomy	0	1
Bowel resection	0	1

NOSE AND THROAT

Tonsillectomies	6	6
Bronchoscopies	6	9
Superior laryngeal nerve section	1	0
Mastoid	0	2
Antrum puncture	0	4
Tenotomy	0	2
Sub-mucuous resection	0	1
Tracheotomy	0	1

GENITO-URINARY

A repair of hydrocele	1	0
Transurethral prostatectomy	1	0
Lithotritomy	0	1

PROCTOLOGY

Injection of hemorrhoids	7	2
Rectal fistula	7	6

BONE SURGERY

Spinal fusions	0	3
Open reduction of dislocated hip	0	2

EXAMINATIONS AND TREATMENTS

Cystoscope	1	11
Removal of cervical polyp	1	0
Cautery of cervix	2	1
Biopsy	4	2
Incision of abscess	5	11
Intratracheal lipiodol injection	1	7
Electrocardiograms	0	7
Blood transfusions	0	2
Curette	0	2
Drainage into lung hernia	0	1
Closed pleural drainage	0	3
Extra-pleural pneumolysis with paraffin pack	0	1
Open lung drainage	0	1
Retrograde urography	1	1
Intravenous urograms	7	10
Physical examinations	269	274
Gall bladder series	1	9
G. I. series	11	9
Plates interpreted for outside practitioners		1225

Laboratory

Sputum specimens examined	1454	1703
Urinalyses	836	1124
Blood counts	456	696
Blood sedimentation	13	33
Wassermann	271	243
Blood sugars	0	2
Pleural fluids examined	19	21
Gastric analysis	10	18
Stool examinations	4	9

Patient population—May 1, 1937—295.

Institutional deaths—May 1, 1936 to May 1, 1937—35.

Deaths of patients already registered, but occurring in the home while awaiting here—18 reported in 1936

12 reported in 1937 to June 8, 1937

It will be noted that the medical staff has increasingly served members of the profession through interpretation of X-ray chest plates and re-mailing the plates to the senders, in most instances supplying the postage for which the state does not make provision, and which thus in one year makes a considerable drain on our finances. A very few only have been attaching return postage to plates mailed for such service. The staff is glad to render the service, but return postage should be furnished with films mailed.

Physical Improvements of Buildings and Grounds

Marked physical improvements in buildings and grounds have been accomplished in the past year by way of Infirmary Unit No. 3 construction and power house already mentioned, besides stone-bouldered road trenches for drainage, with hundreds of tons of earth excavation and dirt removal to provide better drainage.

It is impossible to further particularize and thus encroach on your time and patience; however, we submit to you the statement for your serious consideration that the institution, all in all, is worthy of a special visit in order that you may personally acquaint yourselves with the service it is capable of rendering the state's tuberculous, including your patients.

This is the particular reason for the superintendent's insistence from year to year, while he feels he has been privileged to serve you and the public as its superintendent, that meetings of your committee on tuberculosis should be held at San Haven in order that the members have opportunity to observe its service and disseminate the knowledge to their fellows.

Advantage has been taken of federal set-ups to project other physical improvements in buildings and landscape, including drainage and sewage sanitation.

(Signed) CHARLES MACLACHLAN, M.D., *Chairman*
C. J. GLASPEL, M.D.
PAUL H. ROWE, M.D.
G. W. TOOMEY, M.D.
W. H. LONG, M.D.
W. A. GERRISH, M.D.

President GERRISH: We must have a committee on resolutions. I will appoint on that committee Drs. Meredith, Sherman and DePuy.

Report of Committee on Secretary's Report

President GERRISH: We have a report of the Committee on the Secretary's Report, which I will read.

"Your committee has read the secretary's report, and commend it to the close study of each member of the society. We also commend the secretary for the amount of study and energy he has devoted to the problems of this Association, and to the preparation of this report.

(Signed:) W. C. FAWCETT, M.D.
C. MACLACHLAN, M.D.
M. MACGREGOR, M.D."

What do you wish to do with this report, gentlemen?

Dr. MACLACHLAN: I move its adoption.

Dr. SPEAR: Second the motion. (*Motion duly put and unanimously carried.*)

Secretary SKELSEY: We have a resolution here commending the state institutions:

"Whereas, it is the opinion of the North Dakota State Medical Association that the state charitable institutions in Grafton, Jamestown, and San Haven have been efficiently and economically-operated this past year, and that the mental and tuberculous patients of the state are receiving the proper care and scientific treatment, therefore this Association desires, in convention assembled, to express to the superintendents of these institutions their appreciation, confidence and cooperation."

Dr. SORENSON: I move we adopt this resolution.

Dr. MCCANNEL: I move as a substitute, that we turn it over to the Resolutions Committee and let them bring it in with their report tomorrow.

Dr. NACHTWEY: Second the motion. (*Motion duly put and carried.*)

Dr. BRANDES: I presume it is in order now to extend an invitation for the next annual meeting. I have the happy privilege to extend to you on behalf of the Sixth District Medical

Society an invitation to hold your meeting next year in Bismarck. I have a formal invitation from the City of Bismarck, and the secretary of the Sixth District. We have, as you know, ample hotel facilities, and we would be most happy to entertain you:

"We wish to extend your organization a cordial invitation to hold your 1938 state meeting in the City of Bismarck.

"It is not necessary for us to enter into a discussion of the accommodations and conveniences for your satisfactory entertainment at this point.

"We assure you that in the event you come here, you will receive a cordial welcome and the complete coöperation of the people of Bismarck in your plans to make the meeting an outstanding success.

(Signed:)

Bismarck Association of Commerce, by
H. P. GODDARD, *Secretary*.
City of Bismarck by
OBERT A. OLSON, *Mayor*."

"I have the pleasure of extending to you an invitation to hold your 1938 convention in Bismarck. The members of the Sixth District Medical Society assure you that if you accept this invitation, they will do everything possible to make the convention a memorable one.

(Signed:) L. W. LARSON, *Secretary*
Sixth District Medical Society."

Dr. WILLIAMSON: I move that we go to Bismarck. (*Several seconds were heard; the motion duly put and unanimously carried.*)

President GERRISH: On the nominating committee, I will appoint Dr. Fergusson, Ramstad and Burton.

Dr. BRANDES: There was one recommendation, or suggestion, made in the Report of the Committee on Cancer in reference to radio.

I know there are many objections to participating in radio programs. I think if the matter is given careful attention, the good advantages that come from radio programs would outweigh the disadvantages. I am wondering if some action can't be taken on that from year to year. I think we are missing a fine opportunity to do some constructive work for the North Dakota State Medical Association.

President GERRISH: I agree with you. We are missing a good opportunity. It should be done as a society or state association. They are doing it in Minnesota and other places.

Dr. BRANDES: I think the North Dakota State Medical Association should take some official action. We can't carry out this program unless you state that program here in the state association.

President GERRISH: Will you make that a motion?

Dr. BRANDES: I was going to suggest that the report be turned over to some committee.

Dr. MCCANNEL: I move you that it is the sense of the House of Delegates that the radio be used in spreading information about cancer.

Dr. WOUTAT: Noticing publications in the A. M. A., the Minnesota State Medical Association, etc., radio programs throughout the State of North Dakota, I would think, should be broadcast with the approval of all pertinent committees of the North Dakota State Medical Association, and if necessary, a special committee be appointed to handle that sort of thing. I believe it has unlimited possibilities regardless of whether it should be controlled by the Cancer Committee, Maternal Welfare or Public Relations Committees, and if given the proper publicity, could do as much good as the work done by the American Medical Association and the Minnesota medical society on publicity, etc. I think the thing should be given due consideration, and if necessary, a representative from each committee be put on the committee to direct this work rather than the thing passed over and put to one committee to settle the matter.

President GERRISH: That is a good idea. I think there are other things involved than cancer, and the bulk of the people are not so much interested in cancer as they are in other subjects.

Dr. SORENSON: I think, as Dr. Woutat says, this matter has unlimited possibilities; but if we are going to leave it to each committee to put on something, nothing will happen. There should be a very carefully-selected committee to supervise the broadcasting. It should be broadcast under the auspices of the North Dakota State Medical Association. There should be a committee appointed to handle this, and it should be a very carefully-selected committee.

President GERRISH: I think that is a good idea; possibly a publicity committee or a public relations committee might be established.

Dr. BRANDES: Now we are going to start all over again; however, this is a very important subject to be considered, because if you are going to spread the responsibility of giving radio programs over a number of committees which don't have any technical knowledge about putting on programs, it will be a failure. I believe the best thing would be to form a new committee on radio programs, and let that committee then get these various committees to submit the material to them to broadcast. Then, and in that way, supervising them, you will have a worth-while program.

Dr. SORENSON: I make the motion that we appoint a committee on public relations to take charge of radio broadcasts.

Dr. BRANDES: Second the motion.

Dr. SORENSON: Let the committee decide on their own name. It was the opinion of the Council that it should be subject to the supervision of the Council or House of Delegates. If we appoint a well-chosen committee, I think they would fulfill the requirements.

(The president re-stated the motion, which was duly put and unanimously carried.)

A motion was duly made, seconded and carried to adjourn subject to call.

Fourth Meeting House of Delegates

The adjourned meeting of the House of Delegates was called to order by President Gerrish, at 10:30 A. M., on May 18, 1937.

Secretary Skelsey called the roll, and declared a quorum present.

The following proceedings were had:

Dr. WILLIAMSON: Last year, you remember at Jamestown a resolution was put through to the effect that the outgoing president should be chairman of the Scientific Committee. I thought it was a mistake last year, and I know it was a mistake. We have always had it before with three on the scientific committee, with the president and secretary *ex officio* members of that committee. I think we had better go back to the old way of doing it. I make a motion that we do not approve the minutes as far as the resolutions last year were concerned.

President GERRISH: You wish to make a motion then to repeal that resolution?

Dr. WILLIAMSON: I will make a motion to repeal it.

Dr. NACHTWEY: Second the motion.

(The motion was duly put and unanimously carried.)

President GERRISH: Now will you make a motion as you would like to have the scientific committee?

Dr. WILLIAMSON: I make a motion that the Scientific Committee be composed of three members of the society in whose district the meeting is to be held, and the president and secretary of the state association as *ex officio* members, the same way that it was before we made the motion last year.

Dr. NACHTWEY: Second the motion.

(The motion was duly put and carried.)

President GERRISH: Does the committee on syphilis have any report?

Dr. LARSON: After you decided to make a permanent committee out of that, we didn't have a meeting, because I felt it would be up to the incoming president to appoint members on that committee, so we haven't anything to report, Mr. President, except that I think the incoming president should select that committee with considerable care, because there will be some matters of policy to be decided that are quite important, especially if the Surgeon-General of the Public Health Service

goes through with the program and gets more and more money. We don't know how much will be in here, and we want to keep it in the hands of the practicing physician if we can. I don't think we need any more of a report than that.

President GERRISH: With that report, is it the idea that it would be advisable to have another committee on social diseases?

Dr. LARSON: Make that a permanent committee. Wasn't that decided last night? That was approved, I believe.

President GERRISH: What report have the councillors to make?

Dr. WILLIAMSON: We don't have to do that; however, nothing happened. We are the most peaceful and harmonious group you ever saw. They put \$200 at the disposition of the Economics Committee for the next year, and \$200 to pay some other bills of certain committees. The secretary is to notify them that no expenses will be paid unless authorized.

Dr. LARSON: Take for instance, this committee on venereal disease. If that committee is going to function, they will have to have a meeting at some central point where everybody can easily reach it. Do you want to pay their expenses, and if they have some correspondence, will you take care of that?

Dr. WILLIAMSON: My personal idea is that if we have any essential committee in this society which entails an expense upon the individual member of that committee to function—he is donating his time, so the society should be willing to pay his necessary expense. He pays the same dues as anybody else. Why should he travel at his own expense?

Dr. MACGREGOR: We can't throw the bars down, or there would be no limit to the expense.

Dr. FAWCETT: I think it should be limited to the legislative, executive and economics.

Considerable discussion followed concerning the advisability of paying expenses of committee members, but no definite action was taken.

President GERRISH: We will put Phil Woutat on the committee for revision of the Constitution.

Dr. SHERMAN: I have one resolution drawn up here, which I desire to present at this time:

"Resolved that we wish to express our confidence in the School of Medicine at the University, and in the value of its work to the profession, and to the people of the state. Since the appropriation made by the Legislature of 1937 will enable the school to correct its greatest weaknesses, we would urge the Council on Medical Education and Hospitals to give it favorable consideration."

Dr. FAWCETT: I move the adoption of this resolution.

Dr. BRANDES: Second the motion. *(Motion duly put and unanimously carried.)*

Dr. SHERMAN: At this time, I think it is also appropriate that we should extend to the Grand Forks District Medical Society our sincere appreciation for their efforts and success in carrying out the program commemorating our Fiftieth Anniversary, as well as for their splendid hospitality. We also wish to commend them for the fine scientific program, as well as the other arrangements incidental to the state meeting.

I move the adoption of this tentative resolution, with the request that the secretary convey these sentiments to the Grand Forks District Medical Society.

Dr. MACGREGOR: Second the motion. *(Motion duly put and unanimously carried.)*

President GERRISH: May we have a report as to what we are doing relative to the irregulars?

On page 234 of THE JOURNAL-LANCET, May, 1937, will be found a detailed report on irregulars and some non-ethical physicians in North Dakota.

President GERRISH: May we have the report of the nominating committee?

Report of Nominating Committee

Dr. Fergusson presented the following report:

President: E. L. Goss, M.D., Carrington.

President-elect: W. H. Long, M.D., Fargo.

First-Vice-President: H. A. Brandes, M.D., Bismarck.
Second Vice-President: C. J. Glaspel, M.D., Grafton.
Secretary: A. W. Skelsey, M.D., Fargo.
Treasurer: W. W. Wood, M.D., Jamestown.
Delegate to A. M. A. 1938: A. P. Nachtwey, M.D., Dickinson.

Alternate: C. E. Stackhouse, M.D., Bismarck.

Councillors:

Second District: G. F. Drew, M.D., Devils Lake.

Seventh District: P. G. Arzt, M.D., Jamestown.

Eighth District: F. W. Fergusson, M.D., Kulm.

Tenth District: A. E. Spear, M.D., Dickinson.

Dr. NACHTWEY: I move the adoption of the report of the nominating committee.

Dr. GRAHAM: Second the motion. (*Motion duly put and unanimously carried.*)

President GERRISH: There is one thing I would like to bring before you under the head of new business. I think the work of this Association has become so great that two days is not enough to give to its workings. I would suggest that we do as other state societies around are doing, have three days of forenoon meetings for scientific work, the afternoons for pleasure for those who do not have to work in official bodies of the society and for the work of the House of Delegates, Councillors, and what-not, and in that way we would not have to race around. I think we are large enough now and should consider seriously giving three days to it. Why not have it so we have our programs in the mornings, and the afternoons and evenings for pleasure and other events. When we have to work all day we can't half see the exhibits, and some of the fellows are missing part of the program because they must be on committees, in the House of Delegates, etc. I think you will find it will agree with more of the members than you think to put in three days. The last two or three years our official body of the society has had an awful time to get things done in the allotted period.

A motion was made, seconded and carried that the meeting adjourn.

* * * *

The following committee reports were received subsequent to the annual meeting.

Crippled Children's Committee

Dr. H. J. Fortin, Fargo, chairman of the foregoing committee, submitted the following report:

In North Dakota there has never been a state-wide crippled children's program. The needs of the crippled child have been left chiefly to several philanthropic organizations. Some of the work has been done in North Dakota, but the majority has been done in the other nearby states and Canada.

Under the Social Security Act, it enables each state to care for its crippled children, especially in the rural and urban areas suffering from economic distress. This includes diagnostic clinics, medical, surgical and corrective services, also hospitalization and after care of the crippled child.

Under the Public Welfare Board, a Children's Bureau was established and an advisory committee was appointed to act in an advisory capacity. The committee consisted of the following: Drs. Maysil Williams, J. C. Swanson, H. A. Brandes, A. D. McCannel, and H. J. Fortin.

This committee had two meetings at Bismarck the past year, at which time the type of crippled child, and services to be rendered were taken up. There are certain specifications laid down in the Social Security Act, which must be followed by the states.

Up to May, 1937 five diagnostic clinics have been held at Williston, Dickinson, Devils Lake, Mandan and Minot. There were about 800 children examined at these clinics. There will be five more diagnostic clinics at Bismarck, Grand Forks, Valley City, Jamestown, and Fargo.

A complete report will be ready at the next meeting, after all of the children are examined. This will then give some idea as to the number of children crippled and the types of

deformities found. This is all being tabulated under the Children's Bureau, Bismarck, with Miss Theodora Allen in charge. Any information regarding this work and those entitled to treatment can be obtained from the Children's Bureau.

H. J. FORTIN, M.D., *Chairman*

Committee on Child Welfare

Dr. J. L. Conrad, Jamestown, chairman of the committee, submitted the following report:

The committee had difficulty in determining its functions, and in securing contact with the state department of health. After the return of Dr. August Orr to the state, we held two conferences with him and one of our members, Dr. Brandt, conferred with Dr. Williams, as did Dr. Pray later.

At a meeting of the committee, it was decided that we arrange for a series of seminars to be held in the larger towns of the state. The State Department of Health informs us that there is enough money on hand to finance these meetings.

For these meetings, it is planned to bring into the state some outstanding pediatrician who will hold a seminar for one day in each of the eight larger towns of the state. It is hoped that at those meetings we can have a majority of the men in that vicinity attend.

It is planned to begin these meetings as soon as the necessary arrangements can be made.

J. L. CONRAD, M.D., *Chairman*

Committee on Necrology

Dr. James Grassick, Grand Forks, chairman of the committee, submitted the following report:

As we pay this, our tribute of remembrance to those of our number who, since last we met, have ceased from labor and are at rest, hope holds aloft the torch that lights the way, while love tenderly whispers, this earth may not be all.

An obituary notice of Dr. August Eggers, a past president of our Association, who practiced in Grand Forks, for over forty years, appeared in the November, 1936 issue of THE JOURNAL-LANCET, and of Dr. John E. Engstad, an early secretary of the Association, who practiced in Grand Forks for fifty-two years, in THE JOURNAL-LANCET of April, 1937.

HENRY J. LEIGH

1866—1936

Dr. H. J. Leigh was born at Millidgeville, Ill., June 6, 1866, and died at Grand Forks, N. D., October 22, 1936. He was graduated from Bennett College of Eclectic Medicine and Surgery, Chicago, Illinois, in 1891, and was licensed in North Dakota, January 4, 1924. He had practiced in Sebula, Iowa, Fort Dodge, Iowa, Carrae, Iowa, and in Lakefield, Minn. He came to North Dakota in 1924, located at Tower City, and there continued to practice his profession until shortly before his death. Dr. Leigh was a fine type of the family physician. He went in and out among his patients, counseling, directing, helping; and was beloved by them all. Forty-five years of continuous faithful practice in the healing art, entitles him to a place among the favored pioneers. His son, Dr. Ralph E. Leigh of Grand Forks, is a worthy representative of the profession and of his honored sire.

HENRY A. OWENSON

1884—1936

Dr. H. A. Owenson was born November 11, 1884 in Iowa. He received his literary education in the schools of his native state and his medical training in Keokuk, Iowa. He later took graduate work in Chicago. He was licensed in North Dakota in 1906, and began practice at Deering, N. D. He later practiced his profession at Alhambra, California, and in 1928 returned to Minot where he remained for three years, and then moved to Arnegard where he resided until his death in September, 1936. Dr. Owenson was prominent in local affairs, as well as in his profession, and supervised his own private hospital at Arnegard. During his later years he was in ill health and became despondent. While in this condition, he lost his way amid the mists of life and quietly passed away at his home in Arnegard.

ALEXANDER KENNETH BLAIR 1880—1937

Dr. A. K. Blair was born in Quebec, Canada, in 1880, and passed away of pneumonia at Hampden, N. D., January 2, 1937. He received a classical education and was graduated in medicine from McGill University in 1903. He was licensed in North Dakota in 1912. He practiced his profession respectively in Hampden, N. D., Winnipeg, Man., Minnewaukan, N. D. and again at Hampden, N. D. Dr. Blair was of English, Irish and Scottish extraction, and was a splendid type of the cultured professional gentleman.

He was held in the highest repute as a physician and beloved for his many sterling qualities of mind and heart by those who had the pleasure of his acquaintance. If at times his genial nature swayed his way of life, he never lost his in-born dignity, and bearing of refinement. Personality shines through the most perfect of disguises, and Dr. Blair maintained his fine sense of propriety to the end.

PHILIP GRAHAM REEDY 1881—1936

Dr. P. G. Reedy, born 1881, died at Lisbon, N. D., in 1936. He was a graduate of the College of Physicians and Surgeons, University of Illinois, 1910, and was licensed in North Dakota on July 4, 1913. He practiced for a time at Casselton and later removed to Lisbon, where he remained until his death.

LOUIS W. MYERS 1881—1937

Dr. L. W. Myers was born in Illinois in 1881, and died at Los Angeles, California, April 3, 1937. He was graduated in Chicago in 1905 and was licensed in North Dakota April 12, 1906 as from Bottineau County. After practicing in the state for ten years, he went to Europe, where he remained nine months, and made a special study of eye, ear, nose and throat. On his return he located at Fargo, and was associated with Dr. Axel Oftedal, and later with the Dakota Clinic. He moved to Los Angeles, California about seven years ago, where he remained until the time of his death. He leaves a wife and three children to mourn his passing.

JOSEPH T. NEWLOVE 1867—1937

Dr. J. T. Newlove was born in Ontario, Canada, December 16, 1867, and died at his home in Minot April 6, 1937. He graduated from Detroit College of Medicine and Surgery in 1896 and was licensed in North Dakota the following year. He practiced his profession in Towner for many years and did pioneer work among the settlers in the Mouse River Loop District. In 1902 he moved to Minot where he remained until the time of his death.

Dr. Newlove was highly regarded as a family physician alike by patients and professional associates. He held many positions of trust, and acquitted himself well in them all. He was elected president of his local medical society, was a director of the Pioneer Life Insurance Company, and served on the Minot Park Board for more than twenty years. The Roosevelt Zoo was his hobby, and much of its success was due to his personal supervision. His body was laid away at Towner among his associates and friends of early days.

LEE B. GREENE 1881—1937

Dr. L. B. Greene of Edgeley, N. D., was born at Valparaiso, Ind., April 4, 1881; and came with his parents to the Territory of Dakota in the following year. It will thus be seen that he was a pioneer in the land where he did his day's work at a very early age. He passed away in a St. Paul hospital May 3, 1937. Dr. Greene received his schooling at the Sheldon schools, and at the N. D. A. C., where he received his Bachelor of Science degree in 1901. He was graduated in medicine from the University of Michigan in 1905, and served his internship at the Northern Pacific Hospital at Brainerd, Minn.

He began the practice of medicine at Monango, N. D., later removing to Edgeley, N. D., where he remained until the time

of his death, less the time spent in the Army during the World War. In July, 1917, he enlisted in the Medical Corps, was commissioned first lieutenant at Camp Cody, transferred to Camp Dix, and sent overseas to become battalion surgeon in the First Division with the rank of captain, serving through the Argonne offensive in that capacity. He received honorable discharge April, 1919; but retained the rank of major in the medical reserve.

Dr. Greene was public spirited, and took an active interest in community welfare activities, as well as in state and national affairs. For two terms he served his city as mayor. He was a member of the executive committee of Camp Grassick, and an enthusiastic worker for that institution. He was for a term of three years a member of the North Dakota State Medical Examining Board. He was organizer and commander of the medical detachment of the North Dakota National Guard. He served in high departmental offices of the American Legion and was active in promoting its welfare.

His body was laid to rest with full military honors at Sheldon, N. D. In the passing of Dr. Greene, the profession loses an honored member, the country a loyal veteran of the World War, society an aggressive worker for the public good, his associates an engaging comrade and a fast friend, and his family a devoted husband and father.

Public Health Committee

The following report was submitted through the mails by Dr. Maysil Williams, chairman, subsequent to the annual meeting:

When this committee reported at your last meeting, the theme of the discussion was: "What could be expected from the Social Security Act in improving public health activities throughout the state?" Since that time, the social security program has been started, and a brief review of the public health activities of the year is in order.

The Public Health Department program will be discussed in reference to State Health Department activities, and the local health department activities.

In order to qualify for an allocation of funds under Titles V and VI of the Social Security Act, it was necessary for the State Health Department to provide as a minimum on a full time basis the following services:

1. A qualified full time state health officer.
2. Adequate provision for the administrative guidance of local health services.
3. An acceptable vital statistics service. This should include an approved plan for the registration of births and deaths and the prompt forwarding of information thereto, to the Public Health Service.
4. An acceptable state public health laboratory service.
5. Adequate services for study promotion and supervision of maternal and child health.
6. Special services for the study, promotion and guidance of local activities for the control of preventable diseases and health promotion. This should include an approved plan for the collection of reports of notifiable diseases and the prompt forwarding of information relative thereto, to the Public Health Service.
7. Services for the study, promotion and supervision of environmental sanitation.

The State Health Department in accepting financial assistance under the Social Security Act is expected to foster the development of satisfactory local health service. Allotment of funds for the establishment or maintenance of city, county or district health services are made only when the basis principles of organization in a community are met, namely, the public health services of the city, county or district shall be under the direction of a full time health officer, and when the personnel includes in addition to the full-time health officer such officers and clerks as will insure at least a minimum of effective health service commensurate with the population and health problems of the area concerned.

In order to fulfill these requirements, certain additions had to be made to the State Health Department personnel,

1. Division of Child Hygiene and Public Health Nursing.

On July 1, the Division of Child Hygiene was re-established with Dr. August C. Orr as director of the division, and Miss Cecilia Eyolfson as supervisor of public health nurses. Miss Cecilia Eyolfson resigned in October, and was succeeded by Miss Margrete Skaarup. Dr. Orr was a trainee at the Harvard School of Public Health from September until February. Itinerant pre-school conference work in rural areas was resumed with the re-establishment of the division.

During the year, the North Dakota Committee on Maternal Welfare and Child Health of the state medical society organized and conducted four seminars on obstetrics for the physicians in the state. Dr. John Urner, of the University of Minnesota, was the lecturer. These refresher courses were free to the physicians of the state and all expense was borne by the State Health Department.

2. Division of Preventable Diseases.

On September 1, Dr. J. A. Cowan, of Flaxton, was appointed epidemiologist, and spent three months in the School of Public Health of the University of Minnesota, returning January 1, 1937, after attending the Conference on Venereal Diseases called by Surgeon-General Parran in Washington, D. C., December 26 to 31.

The distribution of free drugs by the State Health Department for the treatment of syphilis was begun January 1. These drugs are available to all licensed physicians in the state upon application and the reporting of the case. The organization of the V. D. program for the state is awaiting the appointment of a committee from the State Medical Association to act as an advisory committee to the State Health Department in formulating plans for North Dakota. Toxoid for diphtheria immunization, smallpox vaccine, typhoid vaccine and Mantoux test material, are available free to the physicians of the state upon application by physicians. The services of the state epidemiologist are available for investigations in any of the communicable diseases, including the venereal diseases, upon the request of a physician through the local county or city health officers.

3. Division of Laboratories.

The two public health laboratories at Bismarck and Grand Forks had some changes and additions to the personnel. Harriet Bixby, B.A., M.D., replaced A. W. Ecklund, M.S., in the Bismarck laboratory and Edwin Wicks, B.S., M.S., replaced K. W. Riley as assistant to Melvin Koons, M.S., in the Grand Forks laboratory. Additional personnel in the way of technicians and stenographic help have been added during the year. The replacing of considerable old equipment in both laboratories with modern equipment has added much to the efficiency of the laboratory service, although the Bismarck laboratory quarters are inadequate for efficient service at this time.

4. Division of Sanitary Engineering.

In the Division of Sanitary Engineering, two engineers were added to the staff, and were given special training at the University of Minnesota. One of these engineers devotes his time to milk sanitation.

5. Division of Vital Statistics.

The demands upon the Division of Vital Statistics have more than doubled during the year, due to the organization of many federal programs where birth certificates and vital statistics information are required.

6. Local Health Service.

Budgets for the North Dakota State Health Department have never included financial assistance for local health work. The bulk of the funds available through social security have been intended to improve local city, county or district health service. Progress in local health work during the past year has been slow for various reasons. The laws of North Dakota make no provision for the combining of local part time county and city health services into full time country or district health services. No one county or city in North Dakota with the exception of Cass and Fargo, Ward and Minot and Grand Forks and Grand Forks City, has a population or financial resources

that would warrant a full-time county or city health department at this time. The minimum full-time unit recommended at this time includes one full-time health officer, one to three public health nurses, depending upon the population, a sanitary engineer and a clerk. Familiarity with the problems of the state has convinced us that district health units will be most practical at this time. A district to consist of several counties with a full-time health officer in charge, a sanitary engineer and a clerk in the district office, with a public health nurse in each county. The present part-time local health officers would function as at present under the district plan.

Permissive legislation for the organization of full-time county or district health departments was necessary, and S. B. 187 was introduced at the 1937 legislature; however, opposition from the anti-medical forces were successful in killing the bill. This was a decided handicap to the development of local health service for the next two years. Local participation in administration and financial support are necessary for the success of any full time county or district health service. It is needless to state that financial participation has been well nigh impossible in many counties due to conditions incident to drought and economic distress, although during the year 17 counties organized public health nursing services and provided some financial support.

After reviewing the activities of the year the committee recommends the following:

(a) The appointment of a committee from the State Medical Association to act in an advisory capacity to the State Health Department in formulating the venereal disease program for the state.

(b) A careful consideration by the State Medical Association of legislation to improve local and state public health services.

(c) Interest in knowledge of guidance for and participation by every member of the state medical society in all local public health activities in their respective communities.

Respectfully submitted,

MAYSIL M. WILLIAMS, M.D.,
Chairman.

B. S. NICKERSON, M.D.
D. W. MATTHAEI, M.D.
E. G. SASSE, M.D.

PROCEEDINGS OF THE COUNCIL OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

1937

First Meeting

Monday, May 17

The first meeting of the Council was held in the Dacotah Hotel, Grand Forks, and was called to order by Secretary Williamson.

Members present: Drs. Ramstad, MacGregor, Wicks, Sorenson, Drew, Spear, Crawford, Williamson.

Owing to the death of Dr. L. B. Greene, president, Dr. MacGregor moved, seconded by Dr. Wicks, that Dr. N. O. Ramstad act as president, and that Dr. F. W. Fergusson, Kulm, act as counselor to fill the vacancy caused by the death of Dr. Greene. Carried.

Minutes

Moved by Dr. Crawford, seconded by Dr. Spear, that minutes of Council as published in THE JOURNAL-LANCET, August, 1936, be approved and adopted. Carried.

Report of Auditing Committee

Drs. Drew and Wicks reported that they had examined the accounts of the treasurer, W. W. Wood, and found them to be correct. Treasurer's report attached.

A motion was duly made, seconded and carried unanimously that the report be accepted and filed.

Moved by Dr. Spear, seconded by Dr. Sorenson, that an amount not to exceed \$200 be allowed to both the Economics and the Public Relations Committee for the ensuing year; carried unanimously.

Moved by Dr. Drew, seconded by Dr. Crawford, that Secretary Skelsey be instructed to notify the chairmen of all committees that no expenses of any committee will be paid unless authorized by this council. Motion carried unanimously.

Report of Committee on THE JOURNAL LANCET

Moved by Dr. MacGregor, seconded by Dr. Fergusson that THE JOURNAL-LANCET be continued as official organ of this Association for next two years, as per former agreement, and that we commend the editorial staff and the publishers for the high type of papers and editorial comments appearing regularly. Carried unanimously.

Moved by Dr. Crawford, seconded by Dr. MacGregor, that President Ramstad and State Secretary Skelsey be a committee to select the editorial staff from this association, to the staff of THE JOURNAL-LANCET. Motion carried unanimously.

Resolution in re Lee B. Greene, M.D., Deceased

The following resolution was prepared and presented by Drs. MacGregor and Sorenson, and adopted:

"WHEREAS, it has pleased Divine Providence to remove from our midst our respected and beloved co-worker, Dr. Lee B. Greene, president of the Council, and

"WHEREAS, his wise council will be missed and the friendly greetings are no more,

"THEREFORE, BE IT RESOLVED, that this Council feels that it has sustained a great loss in his passing, and that we extend to members of his family our sincere sympathy, and that a copy of this resolution be spread upon the minutes of this meeting."

President Ramstad reported that Dr. H. A. Wheeler wished to appear before the Council as regards his non-admission into the Sixth District Medical Society.

Dr. Wheeler was invited to appear at Council meetings and state his case.

Dr. Wheeler stated that he was associated with Dr. Spielman, Mandan, in a loose-group arrangement, and presumes that this Association had something to do with his non-admission; that he had applied for membership in the Sixth District Society, and had failed of election; that he desires to be a member in order that he might hold membership in the State Association.

Moved by Dr. Sorenson, seconded by Dr. Spear that Dr. C. C. Smith and any other members from the Sixth District be invited to appear at Council meeting for questioning re this complaint. Motion carried.

A motion was duly made, seconded and carried that the meeting adjourn until the following day.

* * * *

Second Meeting

When the Council re-convened at 11:30 A. M., Tuesday, May 18, all members were present, and the following proceedings were had:

Moved by Dr. Sorenson, seconded by Dr. MacGregor, that no action be taken at this time in re complaint of Dr. Wheeler in his appeal re action of the Sixth District Medical Society, on account of insufficient evidence. Motion carried.

Moved by Dr. MacGregor, seconded by Dr. Crawford, that the usual amount of \$200 be given the Grand Forks Medical Society to assist in paying expenses of meeting. Motion carried.

Election of Officers

Moved by Dr. Wicks, seconded by Dr. Sorenson, that Dr. N. O. Ramstad be elected president. Carried.

Moved by Dr. MacGregor, seconded by Dr. Fergusson, that Dr. G. M. Williamson be elected secretary. Carried.

There being no further business, the Council adjourned.

GEORGE M. WILLIAMSON, M.D.,

Secretary

N. O. RAMSTAD, M.D.,

President

PROCEEDINGS OF THE GENERAL MEETING of the NORTH DAKOTA STATE MEDICAL ASSOCIATION 1937

First Day

Monday, May 17—Morning

The first general meeting was called to order at 9:00 A. M., at the High School Auditorium, with the president, Dr. W. A. Gerrish, presiding.

Dr. W. A. Wright, of Williston, read a paper on the "Treatment of Burns," with a demonstration of the rapid tanning method by natural color motion pictures.

"Problems in Diagnosis and Treatment of Gastro-Intestinal Hemorrhage" discussed by Dr. D. C. Balfour, of Rochester, Minn., using in connection therewith some slides.

Dr. H. M. Berg, of Bismarck, with the use of slides and manuscript, gave an interesting discussion on "Treatment of Cancer in Sweden."

Dr. George A. Williamson, of St. Paul, in an interesting manner presented a paper and slides on the subject "Fractures of the Spine."

President GERRISH: We will now have our special Golden Jubilee program, under the direction of Dr. Grassick.

This being the Fiftieth Anniversary of Organized Medicine in North Dakota, the local Committee on Program, of which Dr. G. M. Williamson was chairman, was of the opinion that some fitting recognition of the occasion should be given. Acting on this suggestion Dr. Williamson arranged a program for a special hour, with Dr. James Grassick in charge. The following is the outcome.

Golden Jubilee Program

Dr. GRASSICK: It is very appropriate indeed that we should hold our anniversary program in such a beautiful temple of learning, and around an altar that has been dedicated to the quest for truth. Music is one of the cultural arts that is always appropriate, for it speaks a common language, and we are very happy indeed to have with us the Centralian Singers of the City High School, who will favor us with some numbers. It gives me pleasure to present them. *(Several selections were rendered.)*

I believe you will agree with me that this makes a very fine setting for the program that is to follow. These sweet young voices, as yet unmarred by life's activities, bring to us all, lessons of hope, cheer, and inspiration.

The profession of medicine is not hedged within narrow or conventional bounds. It fraternizes with all of the learned professions. It regards the whole domain of human knowledge its legitimate field from which it feels free to cull for the relief of suffering, the prevention of disease and the prolongation of life. The president of our State University, Dr. J. C. West, has very graciously given of his time to be with us for a word of inter-professional greeting. We appreciate this courtesy and have pleasure in presenting Dr. West, of the University.

Dr. WEST: Mr. Chairman and Assembled Physicians:

Simply enough, it falls to me, a member of no profession but with access to all, to bring you the greetings of the professions other than your own. They have watched the medical profession and have been struck with its accomplishments. It may be that they view them from a different angle or point of observation than do those within your own profession. Possibly the outstanding thing they have noticed, apart from the purely technical aspects of your profession, is your continued struggle against ignorance and error, which is but adoption and application of the true University Spirit. It is gratifying indeed to observe that the medical profession has in recent years become truly professionalized.

So in bringing greetings, we do not ignore nor do we minimize the tremendous accomplishments of a technical nature; but we do admire and congratulate you upon your seeking the professional attitude. A true profession must be in control of its education; a true profession must be in control of its ethics;

and a true profession must have control not only of the admission to practice in the profession, but must also have corrective machinery whereby it may discipline the person that falls from the code of ethics established by the profession. On all three of these tests the medical profession is outstanding, and it is because of the control of these three elements that it is able to make the progress that we know it has made, and to promise even greater progress in the future.

And so I bring you greetings, good wishes, fellowship, fraternity, and a prediction of further progress along your own lines. An eminent statesman once said in dedicating a monument: "We must dedicate ourselves to the unfinished work."

I wish I had time to point out some of the unfinished work for your profession, as seen from the other professions. Time forbids this and I can only hope that you will share with me the belief, that this ceremony is not a ceremony in which we look over our shoulders and think of the things we have done, and think of closing the books saying, "There is nothing else to do," but rather, a dedication supported by fifty years of splendid service, looking to the next fifty years, to other accomplishments, to other services rendered to humanity, and to new scientific investigations, observations, and practices. And that, Mr. Chairman, is the thought I have in speaking for and representing all of the professions, wishing you well and starting you out on the second half century of your organization, representative of a most honorable profession. I thank you.

Dr. GRASSICK: We are very happy indeed and honored as well to have with us Mrs. A. W. Ide, wife of Dr. A. W. Ide, chief surgeon of the Northern Pacific Railway, of St. Paul, and daughter of Dr. J. G. Millspough, our first president and the founder of our organization. She has come all the way from St. Paul, to pay tribute with us, to our fellows of pioneer days. She is to read extracts from her father's presidential address delivered at the first meeting of our Association after statehood. Nothing could be more appropriate, for they will show, as nothing else can, the calibre of this man whom we all honor, his far-sightedness and his practical idealism. It is with much pleasure that I present Mrs. A. W. Ide.

Mrs. IDE: Dr. Gerrish, Dr. Grassick, Members and Friends of the North Dakota Medical Association:

Because of my father's activity in this organization many years ago, I feel that it is a great privilege and honor to be asked to represent him here at this time.

Modesty was one of his virtues, but I am sure he would have deeply appreciated the tribute paid him today. He followed the fortunes of this state, particularly those of his fellow practitioners, and he would be proud, were he here today, of the standards and achievements of this group.

Dr. Grassick deserves, and has had much credit and praise for his book on *North Dakota Medicine*, which he published some ten or twelve years ago, shortly before my father's death. As a result of his efforts, much interesting material has been preserved.

I shall read in part from my father's address as the first president of this society.

"Fellow Members of the North Dakota Medical Society:

"Deference to a time-honored custom is my apology for a few remarks on this occasion.

"My first sentiment is one of gratitude to the members of this society for the high honor of being named to preside over your deliberations. Allow me to express my appreciation of your actions and to indulge the hope that the confidence thereby implied has not been entirely misplaced.

"This society germinated a few years ago, during the territorial régime, by a fortuitous concourse of medical atoms, or if you please, in accordance with the evolution hypothesis, in response to a genuine want, a desire for professional association on the part of a number of medical gentlemen in North Dakota. It was felt that no county or mere local society except in two or three instances could supply this want. To whom the inception of the idea was due, I am unable to state. (*The modesty of the man!*—Ed.) It certainly was not novel and is of no interest to us in this connection. However, the gregarious

instinct seems to have been the dominating one, and it is hoped no baser sentiment will obtain the ascendancy until the numerical idea, at least, has been fully evolved.

"It is, of course, too early in our career to indulge in a retrospect or offer a prediction, but I must venture to observe that when we view our present condition and take into consideration the many obstacles incident to our situation, and compare it with the throes attending the birth of similar organizations in the other states, it seems to me that we have reason to conclude that both mother and child are doing well. The attendance and interest in this meeting are gratifying indications of a zeal and determination on the part of the profession to sustain this organization. It seems to me that we are emerging from the woods, from the crucial period in our history; that the omens are favorable; that the work so far accomplished, though small, may be pronounced good.

"This society, the profession, and people of the state, and especially those gentlemen of the profession who were members of our recent legislature, are to be congratulated that our new state starts out upon its career with a law regulating the practice of medicine, equal, if not superior in tone and efficiency to anything that has yet been enacted. In this connection, too, it gives me great pleasure to acknowledge the valuable assistance of Doctor Arthur Sweeney, secretary of the Minnesota State Board of Medical Examiners, and Dr. John F. Fulton, of Saint Paul, in the original draft of this instrument.

"But while we thus congratulate ourselves upon the possession of so excellent and powerful an instrument for good, we must not forget that the duties and responsibilities incident to its proper execution rest with our profession, and if we do not bring to the task a sufficient measure of ability and character, the blame and disgrace of failure will also rest with us.

"Our worthy governor, in deference to our wishes and in keeping with his excellent judgment in other matters, has kindly consented to consider nominations from this society for the Board, whose duty it will be to enforce the provisions of this law. This is as it should be. I hope and trust that our action in this particular will be broad-gauged and such as to demonstrate its wisdom, commending itself to our chief executive, and thus establishing a valuable precedent.

"A celebrated writer has said that 'whatever tends to elevate a profession so important as is ours to the welfare of humanity, necessarily contributes to the benefit of society and the state.' The relation of cause and effect, as here stated, is, I believe, often unappreciated or lost sight of by our own number, and very seldom, if ever, properly recognized by the public. As busy practitioners, occupied with the routine of our art and engrossed with the details of scientific study, we forget that we have a duty to perform to that profession that has done so much for us. Let us bear in mind that whatever we can do towards sustaining this Act, toward securing its wise, firm and impartial administration, will react through the added dignity and usefulness of the medical profession of this state, upon ourselves, and those we serve.

"The direct and only object of this law should be the elevation of the standard of the medical profession. It is hoped that no party ambition, unseemly strife, or any other base consideration will permit us to lose sight of this idea.

"The subject of medical ethics is one that this society has not yet grappled with in a formal way. This is one like the tariff and civil service in politics, always with us and about which much is said, but little done. It is one over which, indeed, in later days the fiercest battles have been fought, upon which the most diverse opinions have been held, and about which the public will not concern itself. I implore your clemency for opening this Pandora's box in your midst.

"This intensity of feeling, however, is an evidence of the great importance of the subject to us. Indeed, without regard for its dictates, all professional spirit and community of interests as students of science would cease and our calling be reduced to the level of a trade or vocation.

"Thanks to the ennobling tendency of our study and work, our profession has been blessed with the most illustrious examples of men with whom the personal element has been sup-

pressed and whose lives were devoted to the upbuilding of their art. This moral development of our profession has always been a purely spontaneous one, and that, too, in the face of the fact that the economic or material interests of the individual has always seemed to be in the opposite direction. Many are inclined to think that this developmental tendency is so spontaneous and contagious that the principle of the golden rule is all that is necessary to guide us in relation with one another and the public. If all were indeed actuated by that principle this would be true. If this were practicable, in our case it would be solved and all law and governmental restraint would be superfluous.

"It seems to me on the other hand that the crowding of the profession at the present day and the material struggle incident thereto necessitates a refinement of ethical conduct not demanded or dreamed of in earlier times. And so, too, in a new and sparsely settled, free-for-all country like this, where two or three, or at most a dozen medical men are perforce brought into professional contact and business association, without any regard to congeniality or compatibility, and having different views as to what may be proper and honorable conduct, it seems to be especially important that there should be some standard fixed by the profession which would serve as a guide in our more important relations.

"Gross breaches of professional ethics among educated men are, I believe, becoming more and more uncommon. This is due, undoubtedly, to an improved educational standard, the more exact nature of our science and practice, the more rapid diffusion of knowledge through our periodic literature, bringing all nearer to the same level of intelligence, to a more just appreciation of the true office of the physician on the part of the laity, and especially to the emphasis that is placed upon this subject at the threshold of our career in the teaching of the schools.

"As evidence of the improved ethical sentiment and practice throughout the world, we may note the tone of the medical press, manifested over the organic act of the American Medical Association, and broad, markedly, in the ethical resolutions passed last year by the Congress of German Physicians, in which are reprobated every kind of public laudation, whether proceeding from the physician himself, or others, all attempts to intrude upon the practice of another, especially on the part of a substitute or consultant, all underbidding in concluding contracts with sick societies or public institutions, the ordering of secret remedies, disparaging remarks about another physician, and in which are laid down ethical directions in regard to the giving of expert testimony where the good name or reputation of a brother physician is involved.

"While, as I say, it is encouraging to observe these evidences of improved moral tone and just dealing amongst our fellows, yet as the professional conscience becomes more enlightened, the demands become more refined and exacting. Every breach of this nature affects not only the parties directly interested, but it has also an injurious influence upon the esteem in which the entire body of the profession is held. The demerits of one man beget mistrust and disrespect for the profession as a whole. In the large cities, where all grades are supposed to exist, these problems adjust themselves with greater facility. Here, professional approval or ostracism is a thing of greater moment.

"It is not my intention to particularize; but rather to call attention to that most excellent and explicit instrument than which none better has appeared, the Code of Ethics of the American Medical Association. My plea is that it may be indeed as in name our guide, until to the title of doctor of medicine will attach, if not infallible wisdom, at least the idea of unimpeachable honor.

"Medical men, as the science advances, are becoming more and more liberal and tolerant. This is true, I think, of all who have any right to claim to be educated, whatever their predilections as to therapeutics. The opinion is prevailing that the title of physician or doctor of medicine is good enough and distinctive enough. A few of the sectarian societies have already dropped their distinctive title. I believe that the essence of the question lies not so much in what this man or that man hon-

estly believes, as in the trading upon a meaningless name. 'Quackery consists not so much in ignorance as in dishonesty and deception.'

"The Royal College of England, one of the most conservative organizations in the world on this question, eight or ten years ago, passed the following resolution, to-wit: 'that while this college has no desires to fetter the opinions of its members in reference to any theories, they may see fit to adopt in connection with the practice of medicine, it nevertheless considers it desirable to express its opinion that the assumption or acceptance, by members of the profession, of designations implying the adoption of special modes of treatment, is opposed to the principles of the freedom and the dignity of the profession which should govern the relations of its members to each other and to the public. The College therefore expects all its fellows, members, and licentiates will uphold these principles by discountenancing those who trade upon such designations.' This can only mean that so long as no distinctive name or trademark is used, a physician is at liberty to hold to and practice after any theory of therapeutics he may see fit.

"I believe that the time is inevitably and soon coming when the principles enunciated by the high medical authority of England will everywhere prevail.

"I allude to this subject at this time because as I believe, we, or at least some of our number, are pursuing a more liberal policy than the Code which we have bound ourselves to respect will sanction, and are thus placing a stumbling-block in the way of others and are virtually effacing all ethical barriers. In proportion as our science becomes more and more exact, and the state more and more insists upon its mastery, will the realm of error recede. But until the leaven of knowledge has more thoroughly permeated the mass and made it possible for a change of position, or while the majority so decrees, the only proper course for the individual is in acquiescence. The folly of such mongrel association is easily demonstrated to any intelligent layman. In our zeal to appear fair-minded and without bigotry, let us beware of stultifying ourselves."

Dr. GRASSICK: Previous to the admission of our Territory into statehood, there were registered in that part which is now North Dakota upwards of 200 doctors of all classes. A recent survey shows that only fifteen of those are now living; and of these we have five with us today on this platform. I will ask them to stand as I name them, that you may know them for their worth, and as outstanding members of our profession. Drs. Chas. MacLachlan, J. P. Aylen, G. W. Glaspel, H. O'Keefe, and myself. The others that were unable for various reasons to attend are: Drs. F. N. Burrows, A. Carr, E. I. Donovan, A. Ekern, A. A. Flaten, J. B. Harris, A. T. Horsman, Thos. C. Patterson, W. H. Welch, and Geo. McIntyre. The latter, who was elected to affiliated fellowship in the A. M. A., sends the following: "As a member and officer of your State Medical Association in territorial days, and a practitioner in the State for forty years, I send my greetings on this your fiftieth anniversary. I am impressed with the calibre of the pioneer men who were responsible for the organization, and with their high ideals and lofty purposes. The intervening years have thinned their ranks, and those who remain deserve well of the profession. I congratulate the Association on its continued success and on the fact that there have not been wanting outstanding men as leaders to guide its destinies through the years."

It is said that when Marshal Ney reported to his chief after the ill-fated retreat from Moscow, Napoleon sternly demanded: "Where is my rear guard?"

Marshal Ney stood erect and saluting, replied: "Sire, I am your rear guard."

With like truth, we may say that this is the rear guard of that valiant force who went forth to battle against human ills, on the plains of Dakota in Territorial days.

The committee which had this program in charge thought that as the wives of the pioneer doctors played such a leading part in the great drama of "Winning of the West," they should have a part in this program, and so I have much pleasure in

presenting to you a lady who is herself a pioneer, who is the daughter of pioneers, and who is the wife of a pioneer doctor of this state, Mrs. E. C. Haagensen, Grand Forks.

Mrs. HAAGENSEN: I think it will be rather difficult to have the doctors so far away. I am more accustomed to being close to them.

Whether the year be 1887 or 1937, I am quite sure the doctor's wife was, and now is, in a class by herself. According to Webster a pioneer is one who goes before to prepare the way. It has been well said: "For age is not alone of time, or we should never see, men old and bent at forty; men young at seventy-three." After thirty-eight years of experience, this subject should be right up my alley. During the recent Minnesota medical meeting, *The Minneapolis Journal* ran a questionnaire on this subject, asking if the lives of the wives present had been sunny, sad, good or bad. How many of those present, if given a chance to live life over, would choose to marry a doctor? Foolish questions! People ask them every day! In my short life, I have learned that you can't dream yourself into character. You must hammer and forge yourself into one.

There is one reply, which doctors use a great deal, and that is, "That's professional." Doctors like gossip as well as others, but when you ask them about anything, you always meet that inevitable reply, "That's professional." Doctors' wives early learn not to talk shop. A huge bird came and roosted near our chimney. I used to wonder why that bird wasn't more professional. But now in 1937 it has become so.

We often speak of horse sense even now. But in those terrible blizzards, while the doctor's wife kept vigil, I well remember, the horses were responsible for the safety of the physician many a time. Oh yes, those were wise horses. Even before we were married, we put the lines in a clip on the dash board, and the horses kept the road. Life was much more strenuous then, than it is now.

In order to paint a pioneer picture, I must tell you of one case. A two-year-old baby boy had fallen into a pig-pen, full of hungry savage hogs. The mother had rescued what was left of the child before we arrived. One eye was gone, one ear was gone, and bites had been taken out of arms and legs. The mother fainted. The bleeding child was cared for on the kitchen table. Miraculously, he escaped infection, and is a fine man today. Too bad the doctor was never paid!

If you marry a doctor, you must be prepared to share him with humanity. You must learn to live a lot, love a lot, and laugh a lot. I recall the story of a patient near Cummings. The doctor had taken her temperature under her arm and departed, forgetting the thermometer there. In a few days he returned. She still had the thermometer there and said she was much better because of the treatment. And there was the young man, who after having had typhoid, ate an apple, core and all.

The doctor was angry that day and said, "Why didn't you bring in the tree, and eat that?"

I well remember opening the front door for a man who was almost breaking it down. It was midnight and a terrific snow storm was in progress. I timidly asked the doctor if it were the first baby.

"No, the tenth," he replied, "why wouldn't he be nervous?"

Some of you recall Dr. E. M. Darrow's favorite yarn. He was a fine gentleman, genial and jolly. He said the family doctor was called into the country to attend a farmer's maid.

Upon examination he could find no trouble, and said, "You are not sick; why lie in bed?"

She replied, "They have never paid me, and I've gone to bed to rest it out."

This antedated the sit-down strike.

Is there any difference now, and then, in the doctor's home?

The small boy expressed it when he prayed, "God bless the American home, even if there's no one in it."

I am sure it was a doctor, who wound up the alarm clock and put it on the back porch, while he placed the milk bottle on the bureau. As a result he missed his morning appointment, and had no milk for breakfast. So absent-minded, often he

forgets his wife entirely. The pioneer doctor's wife? She took the grade with him, and made it, too!

An author; a scientist too, has told us he thoroughly believes that a husband is a present, which from Heaven the wife receives.

But I seem to hear an occasional pioneer doctor's wife say: "You may be gift from Heaven sent; the professor made an error; 'twas the other place he meant."

Dr. GRASSICK: Just a few words in closing. "Hallow the Fiftieth Year" were the words of the great Hebrew Law-Giver, and although thirty-five centuries have elapsed, they still ring out as clear as the silvery tones of a far off mission-bell, and it is well.

This is the fiftieth anniversary of organized medicine in North Dakota, and it is fitting indeed that we take official notice of the occasion, note some of the social and economic conditions that made it desirable, recall incidents in the lives of those who were its sponsors and mark along the way the part it played in the development of our young commonwealth.

In 1861, when the Territory of Dakota was organized with a physician as its first governor, what is now North Dakota had only a mere handful of settlers of white blood; mostly trappers, voyageurs and adventurers. It was not until the decade immediately preceding 1887 that the real influx took place; but what settlers they were! Never had any country a finer group of men and women than were the pioneers of North Dakota. They were the cream of the countries from which they came. Young, strong, progressive, courageous, fearless. They brought with them as chief assets; strong arms, willing hands and dauntless hearts, and these they dedicated to the development of the country of their choice. Into this heritage of the gods, of a land clean, fresh, fair and free, and among a people generous, hospitable, warm-hearted and home-loving, came the pioneer physician who was in no sense less virile, less aggressive or less liberty-loving than the people he served. His trained mind fitted him for leadership; and in addition to the part he played as a physician, he in many instances became an active factor in solving the many social and economic problems incident to a new country. In 1887, there were in all about 100 graduate physicians in the territory comprising the 70,000 square miles of what is now North Dakota, and some of these covered without a rival, ground as large as a New England state. A few may have been "not too learned, but nobly bold" but the majority were graduates from Eastern schools, and for various reasons decided to cast their lots in the then picturesque and colorful West. In the broad acres of our then undeveloped "Land of the Dacotahs," there was space enough, freedom enough, opportunity enough and adventure enough to satisfy the longings of the most ambitious.

Dreams as such may be baseless and fleeting as the mists of morning on the one hand, or the foundation on which are built the best of human accomplishments on the other. They are in reality the torches that light the way of progress. To see visions and to dream dreams however is not enough. We must Raphael-like paint our visions and our dreams. The real progressives of our age, or of any age, are those who have interpreted their dreams in terms of action; and Dr. J. G. Mills-paugh, the founder of the North Dakota Medical Association and its first president, was such a one. He was well fitted for the task, and in that sense may be said to have had a call to the work; for preparation is the real call to leadership in any great undertaking. Like a ranchman of the Bad Lands, who later became a president of the United States, he came to the Territory seeking health. While resting and gaining strength, he had leisure to observe and to think. He recognized that his fellows in the profession were so many freelances, individually battling with problems that were common to all, and making no general advance.

He saw as did Kipling that "The strength of the pack is the wolf and the strength of the wolf is the pack." In other words, that although scouts and skirmishers were all right in their respective places, organization and coöperation were what were needed to get the best results. He had a vision of a united profession with new aims and new ideals, and he set himself

with all the ardor of an enthusiast to make his dreams take on form and substance; and history records how well he succeeded. In May 1887, Dr. Millspaugh arranged for a social gathering in the city of Larimore, of a small group of men with the forward look—Drs. Montgomery, Rounsevel, Murray, Lund, Conkey, Engstad, and a few others. Before they parted, an organization was formed of what in the future was to be known as the North Dakota State Medical Association. It was a small beginning, but it had in its structure all the possibilities and potentialities of organic development. This coterie of devoted men planted their ideals in virgin soil, and had the satisfaction of seeing many of them grow and wax strong; while others as might be expected, were choked in the dense growth of primal things; and had to be replanted by future leaders.

In all new countries, the pressing physical problems are the first to claim attention and demand solution. Homes have to be built, bodies clothed, feet shod and mouths fed. It is little wonder therefore that at times, the beautiful and the esthetic were overshadowed by the customs of the times that the free spirit of the West seemed to foster. But this was not for long. The Association as the years came and went, grew mightily until its influence was felt in every nook and corner of the state and beyond. In 1890, when it met in annual session at Jamestown, it was as fine a representative professional gathering as could be found anywhere, with a scientific program that would have done credit to a metropolitan center. While still in the swaddling clothes of statehood, a new Medical Practice Act, drafted by the Association's legislative committee and piloted through the legislature by Dr. John Montgomery, a charter member, was considered by competent authorities as a great advance on previous measures, and one of the best of its kind in the country.

While these concrete advances were taking place, other forces were quietly at work. What is so fine as the members of a great profession meeting in the spirit of brotherhood, peace and unity, and working to lift standards of life to higher levels; and what is so beautiful as the members of an organization reacting to the highest of ideals and laying their choicest gifts of mind, heart, learning and service on the altar of human welfare? These intangible, ethical by-products that cannot well be weighed or measured, but are none the less real on that account, are among the most valuable contributions our Association is making to society.

Among the Scottish clans, there was a custom that lends itself to our purpose. In the old days, every chieftain was the head of a small army whose individuals worked for him in times of peace, and were led by him against a neighboring clan or a common enemy of the country, in times of war. When the Fiery Cross, the symbol of contest went forth, and the shrill notes of the pibroch echoed from cliff to cliff, stalwart kilted Highlanders responded to the call. At the trysting place, there was the Cairn of Remembrance. Before leaving on a mission of war, each clansman placed a stone on the Cairn, and if fortunate enough to return, removed one. In the course of years, a monument, as rugged as their native hills, was reared, representative of those who had fallen in defense of country, clan, or cause; and each stone in the Cairn was a personal contribution. It was a sacred and a hallowed thing, this Cairn of Remembrance. Sacred to Memory, to Duty, to Honor and to Truth.

May we not in like manner approach this Fiftieth Anniversary of our Association and as we gather around it, if not as a Cairn, at least as a Day of Remembrance, reverently and appreciatively, pay our tribute of memory to those of our pioneers who gave the best of which they were capable for the cause of human betterment?

But this is not enough. Let us go forth in the spirit of adventurous truth-seekers and take possession of the vast areas of unplanned knowledge that invite the plow and harrow of the pioneer; let us with pick and shovel of the prospector, seek out and uncover the rich lodes of golden treasures that await our coming; and as loyal soldiers of the common weal, let us gird our loins for the battle and go forth against the enemies of our race that lurk in darkness as well as those that are rampant

at mid-day, and cease not until the going-down of the sun. In this way, by re-dedicating ourselves to the tasks that lie before us, we may be deemed worthy representatives of a worthy profession by those who follow after.

President GERRISH: Doctor Grassick, on behalf of the Association I want to congratulate you and the others who took part with you, in presenting this timely Anniversary Program.

We will close by singing *America*.

Afternoon Session

The Association reconvened at 1:30 P. M., and was called to order by President Gerrish.

Dr. E. L. Tuohy, Duluth, Minn., discussed "Bone Marrow: Its Vital Importance to the Body."

Dr. W. H. Long read an interesting paper on "The Management of Nephritis."

Dr. R. H. Waldschmidt presented a paper on "Initial Care and Treatment of Accidental Injuries."

At this juncture, a fifteen-minute recess was declared to enable the members to view the exhibits.

Dr. Arthur E. Smith, Los Angeles, Cal., discussed "Plastic Surgery," and in connection therewith showed several reels of natural-color motion pictures.

The meeting adjourned at 6:15 P. M., to re-convene at 9:00 A. M., on May 18th, 1937.

Evening Session

At 6:30 P. M., the annual banquet was held at the Hotel Dacotah, following which a program was given, Dr. A. D. McCannell acting as toastmaster.

The president delivered his address, and the guest speaker of the evening was Dr. E. L. Tuohy of Duluth, Minn.

Presidential Address

W. A. Gerrish, M.D., Jamestown, N. Dak.

My friends and fellow practitioners:—I bring you greetings, good will and personal felicitations.

This annual meeting of the North Dakota State Medical Association brings to a close my tenure of office as your president. Words fail me in my efforts to express to you my appreciation of the great privilege of being your leader during the year that is now drawing to a close. I know of no greater honor that could come to any physician than to be selected as president of a state medical association. It is the crowning event of a physician's professional life. I also realize that associated with this high honor, there is a great responsibility, not only to the organization as a body, but to every individual member thereof. How well I have fulfilled the great confidence you have reposed in me only time can judge. I can only say that I have labored with an eye single to what I believed to be the best interests of the State Association and its individual members.

Naturally, among my first words on this occasion, I should express my gratitude for your splendid coöperation. The willing, cheerful and efficient work of our members, officers and numerous committees is worthy of most honorable mention.

This is the fiftieth anniversary of organized medicine in North Dakota. Only recently we jointly celebrated in Aberdeen the semi-centennial of organized medicine in the Dakotas. For that reason, we are not attempting a real celebration.

Progress is not automatic. The world grows better because there are high-minded souls who wish that it should, and because they will and dare to take the right steps to make it better. So we commemorate the efforts of those great pioneers of medicine, who felt that the

scheme of human relationship was out of balance, and capitalizing the gregarious or fellowship instinct and the altruistic desire to serve, inherent in most men, gave us organized medicine. To them we acknowledge a debt of gratitude.

Life's tale is soon told. The years, which in childhood loom large as planets, shrink fast as we journey along life's highways, and the mile posts move rapidly by, but whether we be blessed by long careers or short, there are hours enough if we but use them. No man has done enough for his fellows. We are ready for the treasures of new friendships, which make wisdom splendid, offices and honors beautiful, and offer us never-ending hours of pleasure. This mutual gathering-together in a great outpouring of fellowship lends itself well to the creating of new friendships, and to our greater usefulness as factors for good in community life.

The finest ideals will not propagate themselves. In organized medicine we have the happy combination of ideals plus organization. Individuals may worthily desire to serve and build, to imbibe deeply of friendliness, tolerance and understanding; but alone they fail to pierce the armored hide of indifference, selfishness, hate and bigotry. But with an organization of men similarly imbued with, and fortified by, an exchange of ideas, mutual helpfulness, and a splendid association which marshals for him an array of leadership, experience, facts and literature, and binds all together in a perfect union, he becomes an integral part of a great altruistic force for human good.

We are a great body with maturing obligations and of recognized importance in the councils of the continent. We may be proud of the past, but we grow with the years. On this anniversary, we think of the fine and outstanding achievements of a glorious past, but we consecrate ourselves to a larger future of helpful service to humanity.

It is fitting and proper that we bear in remembrance our members who have responded to the last call during the past year:—Alexander Keith Blair, Minnewaukan; August Severin Eggers, Grand Forks; John Evan Engstad, Grand Forks; Lee B. Greene, beloved vice-president, Edgeley; Henry J. Leigh, Tower City; Louis W. Meyers, Fargo; Joseph T. Newlove, Minot; Henry A. Owenson, Arnegard; and Philip Graham Reedy, recently of Casselton.

A speaker cannot do anything for the perpetuation of the glory of extraordinary souls. LeSage was right when he said that "Their deeds alone can praise them." No other praise is of any effect where worthy names are concerned. It needs but the simple story of deeds faithfully performed to create and sustain glory. Memory brings their smiles, their words, their deeds, and the memory of their high courage, unselfish devotion, noble purpose and unbounding love strengthens our resolve to make our own lives more pure and remembrance of our dear ones "Whose lips though silent still speak through ours," and who will rejoice if we but bring "the flower of life to a perfect fruitage." We leave them in His keeping, "Who doeth all things well."

These meetings serve many excellent purposes. They provide the opportunity for renewal of friendships, for interchange of ideas, for the taking of inventories of those abstract possessions which can be neither bought nor sold. In a world where transportation and communication are so swift and so certain, we find difficulty in stopping long enough to determine our position, the distance we have traveled, or the direction in which we are tending. Our task today is to achieve perspective, for we are told "The young have aspirations that never come to pass; the old have recollections of things that never happened."

As I speak to you, I feel very much like a guide in a museum trying to show to a group of visitors the treasures of the building, but provided with only a small box of matches in the way of light. He would strike a match, hold it for an instant before a picture or a statue or a case of jewels, and then it would flicker out; another match, in the same feeble way, would provide just the hastiest glimpse of another beautiful and valuable object. So, in trying to tell you a little of a subject which is as broad as the world in which we live, I can only give you a bare and rather kaleidoscopic introduction. I do it with the hope that something I say will make you want to know more, and to follow through some of the roadways of thought to which I can barely point.

This is not the time for didactic essays or ornate orations. In these days which are, to use the fine phrase, "the times that try men's souls," the only thing that is valuable in speech is sincerity, and it is in that spirit I speak to you for a few minutes on "State Medicine."

United States doctors have had tough sledding. The depression was only one of their troubles. Among their other trials we find: free clinic service has quadrupled in a decade; medical men now treat gratis 500,000 of the nation's daily sick list of 1,250,000.

Pay clinics have had a recent mushroom growth. They were designed for down-trodden white-collared workers, and operate on a system of small fees. Doctors must give their services free, while other employees are paid. Competitors have been chiseling fat slices from the national medical dollar; osteopathy forty-two million a year, chiropractic, sixty-three million a year, besides a living for three thousand naturopaths and ten thousand Christian Science practitioners. Lesser bad breaks for the doctor's pocket book have included free hospitalization of veterans and a mass-production contract system of medicine fostered by insurance companies and compensation clinic work.

And now, with the calling of many prominent proponents of the socialization of medicine to Washington during the past year, we may expect renewed action against organized medicine from the Social Security Act in amendments to be introduced.

Two widely antagonistic forces are striving for dominance in America. On one side is the desire and ambition of the individual to live his own life and carry his own responsibilities and secure the utmost mental and material development; while on the other is the ambi-

tion to have the people subjected wholly to herd ideas whether advantageous or otherwise—with only an inner certitude, a personal sense, necessarily imperfect, that the way the herd is directed, is also the best way. The contest is between individuality and regimentation; and while regimentation with its attendant oppression has secured high place among decadent nations of Europe, it will be fought bitterly in an America, which has grown great through private initiative. The doctor is by nature and training an individualist, and sometimes so zealous that he is reluctant even to join his fellows in a common aim, but there is no field where such an attribute is more essential than in medicine. With proper professional equipment and wisdom, the doctor should be free to exercise his best judgment in his gallant struggle against disease and death and to bring unhampered all his skill and experience to succeed in his daily combats with life's enemies.

Regimentation on the other hand deprives the average mind of all chance of growth, and the ambitious mentality of all hope of fruition. Simultaneously, it diminishes that superb efficiency which appears when a person responds to the normal incentives to happiness and success; incentives that arise from an inherent consciousness of a personal importance in the world of affairs. Such individualism undoubtedly has often been carried to an extreme by zealous medical men. In their desire to conquer disease and help humanity, they have become the slaves of charity. They give as always of their services gladly to the poor. Even before the war, doctors gave gratuitous medical and surgical treatments to the value of many thousands of dollars per year per doctor, and since that catastrophe the profession has been strained to the utmost in time, service and money. Yet the salaried altruists prate to the doctors about philanthropy—to doctors, mind you, who almost invented this ministry.

The time-honored attitude of the profession toward the indigent sick is well-known, too well, perhaps, and often imposed upon by such apostles of regimentation as the foundations, the salaried altruists, the social theorists and "charity brokers" who are anxious to enlarge the organizations they conduct, and thus increase their personal prestige. Many institutions, and at present may supervisors in the emergency relief service, vie with one another to secure a numerical increase in their "clients" for the enlargement of their personal perquisites and importance. The principle is fallacious and unworthy. We should as reasonably expect the prisons and asylums of the state to compete for inmates. Such ambitions can only result in injury to the personal pride, self-esteem and lead to moral deterioration of the victim. A worthy citizen is entitled to adequate aid until he is competent to carry on, but as soon as possible, the support should be withdrawn, lest his morale be broken down, and a chronic dependency established.

The practice of charity is one of the most ancient and glorious traditions of medicine, but the doctors are aware that this phase of their calling is not infrequently misunderstood and abused by the undeserving, for that

charity is pernicious which takes from independence its proper pride and from mendicity its proper shame. The abuse of charity leads for the physician to pauperization of the body and for the patient to the even more serious pauperization of the soul. The abuse of charity moreover arouses the indignation of the doctor, since every such care of malingering prevents the extension of legitimate aid to a worthy object. Loss of morale is an inevitable consequence where high ambitious qualities are regimented.

The exercise of charity which has always been cherished as a laudable virtue has now become an organized and remunerative industry in the hands of social theorists who under the mask of humanity hoodwink the government, prey upon the doctors, exploit the poor, and weaken or destroy the virile American traits of self-respect, resourcefulness and resolution, so that they themselves may tread the primrose path. With a full knowledge of these conditions, the medical profession has been striving to correct social evils, accommodate its work to the changing face of society; and adapt its practice to the gradual mechanization and industrialization of American life. New forms of medical procedure are being tested in nearly all the states, and unusual plans for medical service are being introduced. These experiments cover in some degree every aspect of medical work, and while some are conducted honestly and ethically, others are devised exclusively for a personal advantage. Schemes of medical and hospital insurance, free and pay clinics—medical care for a fixed yearly fee; contract practice and corporation practice, are the most common examples.

Corporations, casualty companies and insurance societies are usually the outgrowth of lay efforts to exploit the medical man, but in California and Washington, in Michigan, Massachusetts, Utah, Georgia, Virginia, Ohio, and other states, sincere efforts are being made to change the character of professional activity without a corresponding loss in that quality of competence and efficiency which stands highest in the world today. Some of these hundred or more projects under trial by county societies have been tentatively indorsed by medical authority, and if allowed to develop, will in time find a proper and satisfactory adjustment.

These methods of careful experimentation, however, are too slow for the social theorists and salaried altruists who want the world revamped according to their vaporous fancies while they still are able to enjoy the expected prestige and financial compensation. They are possibly aware that the earth is some fifty millions years of age and alters slowly, but hope nevertheless to bring about a radical reversal of social conditions in a few intense, unnatural months. The social theorists have always existed, but the salaried altruists and the "charity brokers" are purely modern productions. They belong to that large company of adventurers who prefer to exploit the assured, rather than to explore the unknown. Thus they strive for regimentation of workers, and employers, of proletarians and scientists, and of physicians, by fiat. They visualize a large, clean, orderly housekeeping plant

with themselves at the head and all personal ambitions and means of development abolished or subordinated to their personal theories regarding the method and direction which evolution should pursue and where remuneration could be most worthily and satisfactorily bestowed.

The immediate goal which the professional altruists hope to attain in medicine is socialization. This is a menace both to medicine and to the public. It is a most important factor, however, in their plan; for the only social advance that ever obtained recognition was won by way of medicine. This is the first step, therefore, in a purpose openly or hesitantly admitted at Washington to kill our democracy and substitute in its place a collective form of government, which will reduce the entire productive portion of the population to the level of serfs. This being accomplished, the serfs can be put to work to support the lazy, the thriftless, the incompetent, and the subnormal, who are the particular pets and the most hopeful beneficiaries of the salaried altruists in their experiments. The most ominous feature of this puerile program is the effect upon the hopeless victim, who is arbitrarily deprived of pride, ambition, and all incentives to effort. He is reduced to a soft, sloppy, gelatinous existence wherein only two primitive desires survive—to eat and breed. This social subversion was attempted once before, though very cautiously, by the passage of the Sheppard-Towner law, which was rejected by several states.

Socialization of medicine is state medicine, and the latest attempt in this present upheaval is the passage of the Social Security Act. This act has a more plausible approach and a deeper rouge to hide its vaster viciousness, its more incisive teeth, and its more dangerous political purpose than its predecessor's. It is open, however, to the same objections, and should receive the same thoughtful and united opposition.

We have no sympathy with paternalism or unwarranted dependence on a grandmotherly state, either in medicine or commercial affairs. We are a staunch supporter of state rights, of local autonomy, of private initiative and neighborly coöperation. Bureaucratic administration is a menace to personal freedom and social progress, and we may add also that it spells ruin to medical efficiency.

State medicine cannot change human nature, though it may alter relations. Independence in medical practice is an essential to the happiness and prosperity of doctors and to the advance of scientific medicine, as independence in citizenship is to the welfare of the government and this priceless independence gained by prodigious expenditure of blood and treasure should under all circumstances be sacredly preserved to the people of these United States.

In your thinking, start not with purely economic considerations, not with purely materialistic considerations; but start with fundamental values of medicine. Some of you have heard the story about a fellow in East Tennessee who was lost in the mountains. He wandered around, and finally came to a mountaineer's cabin. An old fellow was sitting in a cane-bottom chair on the

porch, with an old ten-gallon hat pulled over his eyes, taking a nap. The traveler called to him and the old man came down to see what he wanted.

He said, "I want to know how to get to Knoxville from here."

The old mountaineer thought a minute and said, "Well, you go up this here trail, and at the first gulch you come to at the right, you go down that gulch about three miles and turn to the right."

He then got to thinking about how rough the so-called road was, and said, "No, that won't do; go over here about a mile-and-a-half, and take the first gulch to the left, and go about two miles and turn to the left."

He recalled that was also rough, and again directed the traveler a third way, took that back and said, "Look here, mister, if I was you and was going to Knoxville, I wouldn't start from here."

My plea is that in your thinking about all these things you are constantly reading about and talked to about, start from the right place—start with the fundamental values of medicine—don't ever lose sight of the fact that the work of medicine can be done only by a qualified, humane, idealistic profession. I have put the emphasis on profession. Don't overlook many of the influences that are persistently at work today, including some of our so-called philanthropies—and the perils of philanthropy are very real—whose whole tendency is to create conditions that will pull medicine down from the status of a profession. There is nothing that will retard scientific progress, and destroy the possibility of the people's receiving good service more completely than demotion of medical practice from a truly professional status.

You are servants of humanity, and have a humanitarian service to perform which can be best accomplished by organization and coöperation and education.

It is this coming-together of earnest men—each with his individual experiences, but all with a single engrossing purpose—which keeps our beloved science abreast of the times and ever ready for the next forward step. The full and candid presentation of our varied experiences—our mistakes and failures, no less than our successes—makes possible intelligent comparison, stimulates suggestion and leads to discussion, out of which each of us surely may gather somewhat of profit.

We want to practice the Golden Rule in our organization as much as possible; however, we should not be satisfied with merely doing unto others as we would have them do unto us or living to let live, but may we as an organization live to help others. If we but apply this axiom to our own lives by putting our own house in order first, then we shall be better able to help our town, state and nation in a more ideal way.

In carrying out these ideals of service to ourselves and one another, we unconsciously become one common happy family working for a common worthy cause.

Coöperation is spelled with two letters—W—E.

There is power in organization for good or for evil. Good teamwork is an essential factor in any undertaking.

"What makes that woman look so homely?" asked one man of another.

The other took a look at the woman and said, "Don't know; she has good eyes, a good nose; she has a good mouth and good cheek bones; she has a good forehead, but her features don't seem to understand teamwork."

My friends, it is time to bring these crowded remarks to a close. Reject what in them is false; examine what is doubtful; remember what is true.

SECOND DAY

Tuesday, May 18—Morning

The Association re-convened, and was called to order at 9:00 A. M., by President Gerrish.

Dr. R. D. Mussey, Rochester, Minn., read a paper on "The Course, Conduct and Complications of Pregnancy Among Physicians' Wives." He used statistical slides to illustrate his address.

"Anesthesia and Relief of Pain by the General Practitioner," was discussed by Dr. John S. Lundy of Rochester, Minn.

Dr. Kent E. Darrow read a paper on "Problems in the Diagnosis of Obstruction in the Bowel."

Dr. R. O. Goehl presented a paper on "A Discussion of Protamine Insulin."

President GERRISH: At this time, I want to thank the Society for the honor it has bestowed upon me, and for the hearty, willing coöperation I have received from each and every member thereof. At this time it gives me great pleasure to introduce to you your new president, Doctor Goss.

Dr. Goss: This is indeed an honor, gentlemen, to be elected president of the North Dakota State Medical Association. It comes after a great many years of waiting. Forty-five years is a long time to wait; so I am going to tell you young fellows you had better be prepared when it is thrust upon you.

Another thing that I am going to ask you to do is to attend every meeting of every local medical society that you possibly can. You can go whether you have a paper or anything to say. And be sure to attend the annual medical meeting at Bismarck next year.

Doctor GERRISH: The program this afternoon will be rearranged a little bit. I am telling you now, as some of the members might be interested in the treatment of syphilis, which as I understand it, will be the subject discussed this afternoon by Dr. Paul O'Leary, of Rochester. Dr. O'Leary has to get away on the early train and he has asked that he be the first one on the program this afternoon, which change has been made.

The Fiftieth Annual Session of the North Dakota Medical Association adjourned at 12:00 Noon.

DISTRICT AND COUNTY ROSTER

CASS COUNTY MEDICAL SOCIETY

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Swanson, J. C.	Fargo	Fortney, A. C.	Fargo	Nichols, W. C.	Fargo
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Aylen, J. P.	Grafton	Haugen, H.	Fargo	Patterson, C. H.	Veterans Hospital, Fargo
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Barnes, N. J.	Fargo	Haynes, G. H.	Lisbon	Pray, R. E.	Fargo
Boerth, E. H.	Buffalo	Heimark, A. J.	Fargo	Richter, E. H.	Hunter
Borland, V. G.	Fargo	Hendrickson, G.	Enderlin	Rindlaub, Elizabeth	Fargo
Bray, R. B.	Fargo	Hunter, G. W.	Fargo	Rostel, H.	Fargo
Brown, W. G.	Fargo	Huntley, H. B.	Kindred	Rothnem, T. P.	Fargo
Brown, R. C.	Fargo	Ivers, G. U.	Fargo	Sand, O.	Fargo
Burton, P. H.	Fargo	James, J. B.	Page	Schatz, G.	West Fargo
Clay, A. J.	Fargo	Jelstrup, C.	Big Lake, Minn.	Sedlak, O. A.	Fargo
Darrow, Frank I.	Fargo	Joistad, A. H.	Fargo	Skarshaug, H. J.	Fargo
Darrow, Kent	Fargo	Kaess, A. J.	Fargo	Stafne, W. A.	Fargo
Dillon, J. G.	Fargo	Lancaster, W. E. G.	Fargo	Stolinsky, A.	Lisbon
Elofson, C. E.	Fargo	Larson, G. A.	Fargo	Skelsey, Albert W.	Fargo
Evans, L. J.	New York	Lewis, T. H.	Fargo	Swanson, J. C.	Fargo
Ferguson, W. C.	Fargo	Limburg, M.	Fargo	Tainter, Rolfe	Fargo
Fjelde, J. H.	Fargo	Long, W. H.	Fargo	Tronnes, N.	Fargo
Floew, A. T.	Fargo	MacGregor, M.	Fargo	Watson, E. M.	Fargo
Fortin, H. J.	Fargo	Miller, H. W.	Casselton	Weible, R. E.	Fargo
		Morris, A. C.	Fargo	Winn, W. R.	Fargo
		Nichols, A. A.	Fargo		

DEVILS LAKE DISTRICT MEDICAL SOCIETY

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Arneson, A. O.	McVile	Graham, J. D.	Devils Lake	Sihler, W. F.	Devils Lake
Bartle, J. P.	San Haven	Greengard, M.	Cando	Smith, C.	Devils Lake
Call, A. M.	Rugby	Horsman, A. T.	Devils Lake	Sedlacek, B. B.	Ft. Totten
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Dodds, G. A.	San Haven	Lees, H. D.	Philadelphia, Pa.	Toomey, G. W.	Devils Lake
Engesather, J. A.	Brockett	Lund, A. B.	Leeds	Verrett, B. B.	Rollo
Fawcett, J. C.	Devils Lake	MacDonald, J. A.	Cando	Vigeland, J. G.	Brinsmade
		McGurren, C. J.	Devils Lake	Widmeyer, J. P.	Rollo

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SECRETARY	
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Alger, L. G.	Grand Forks
Benson, T. Q.	Grand Forks
Bentzen, Olaf	Grand Forks
Benwell, H. D.	Grand Forks
Campbell, R. D.	Grand Forks
Countryman, J. E.	Grafton
Countryman, G. L.	Grafton
Field, A. B.	Forest River
Flaten, A. N.	Edinburgh
French, H. E.	Grand Forks
Glaspel, C. J.	Grafton

Glaspel, G. W.	Grafton
Goehl, R. O.	Grand Forks
*Grassick, James	Grand Forks
Haagensen, E. C.	Grand Forks
Hardy, N. A.	Minto
Hofto, J. M.	Grand Forks
Irvine, V. S.	Park River
Landry, L. H.	Walhalla
Law, H. W. F.	Grand Forks
Leigh, R. E.	Grand Forks
Liebeler, W. A.	Grand Forks
Lohrbauer, L. T.	Grand Forks
McQueen, W. W.	Langdon
Mahon, Ruth	Grand Forks
Miller, J. P.	Grand Forks
Moore, J. H.	Grand Forks
Mulligan, T.	Grand Forks
Mulligan, V. A.	Langdon
Muus, O. H.	Grand Forks

Needles, A. S.	Grand Forks
Orr, August	Bismarck
Panek, A. F.	Milton
Peake, M. F.	Grand Forks
Quale, V. S.	Grand Forks
Rand, C. C.	Crystal
Ruud, M. B.	Grand Forks
Rystad, O. H.	Grand Forks
Stromberg, G. E.	Langdon
Thompson, A. Y.	Larimore
Tompkins, C. R.	Grafton
Vance, R. W.	Northwood
Wagar, W. D.	Michigan
Waldren, H. M., Sr.	Drayton
Waldren, H. M., Jr.	Drayton
Weed, F. E.	Park River
Williamson, G. M.	Grand Forks
Witherstone, W. H.	Grand Forks
Woutat, P. H.	Grand Forks

KOTANA MEDICAL SOCIETY

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SECRETARY-TREASURER	
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AbPlanalp, I. S.	Williston
Craven, J. P.	Williston
Dochterman, L. B.	Williston
Johnson, P. O. C.	Watford City
Hoepfer, P. G. E.	Williston

Jones, C. S.	Williston
Schwinghamer, E. J.	Grenora
Skovholt, H. T.	Williston
Wright, W. A.	Williston

NORTHWEST DISTRICT MEDICAL SOCIETY

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Blatherwick, W. E.	Van Hook
Breslich, P. J.	Minot
** Honorary	
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Carr, Andy M.	Minot
Cameron, A. L.	Minot
Cowan, J. A.	Bismarck
Devine, J. L.	Minot
Dalager, N. O.	Anamoose
Dyson, R. E.	Minot
Erenfeld, H. M.	Minot
Fardy, M. J.	Minot

Frogner, G. S.	Parshall
Grangaard, H. O.	Ryder
Goodman, Robert	Powers Lake
Garrison, M. W.	Minot
Gillespie, D. R.	Mohall
Halliday, D. J.	Kenmare
Halverson, H. L.	Minot
Hanson, G. C.	Minot
Haraldson, O.	Minot
Hayhurst, J. O.	Rolette
Ittkin, Paul	Tolley
Johnson, J. A.	Bottineau
Kermott, L. H.	Minot
Kolb, F. K.	Granville
Kempthorne, C. R.	Minot
Krogstad, L. T.	Minot
Lampert, M. T.	Minot
McCannel, A. D.	Minot

McGauvran, T. E.	Velva
McGee, W. J.	Flaxton
Moffatt, G.	Crosby
Nelson, L. F.	Bottineau
O'Neill, R. I.	Minot
Pence, J. R.	Minot
Pence, R. W.	Minot
Ransom, E. M.	Minot
Rollefson, C. J.	Crosby
Rowe, P. H.	Minot
Rollie, C. O.	Drake
Smith, J. A.	Noonan
Sorenson, A. R.	Minot
Seiffert, G. S.	Minot
Timm, J. F.	Makoti
Wheelon, F. E.	Minot
Weeks, S. A.	Ambrose
Yeomans, T. N.	Minot

RICHLAND COUNTY MEDICAL SOCIETY

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†Thane, Benj.	Wahpeton
SECRETARY-TREASURER	
Hoskins, J. H.	Wahpeton
Bateman, C. V.	Wahpeton
† Deceased	

Beithon, E. J.	Hankinson
Durkee, C. E.	Abercrombie
Hoskins, J. H.	Wahpeton
Landers, C. H.	2469 N. Holliston Ave., Altadena, Calif.
Miller, H. H.	Wahpeton
O'Brien, L. T.	Wahpeton

Olson, C. T.	Wyndmere
Pangman, W. J.	3550 10th St., Riverside, Calif.
Reiswig, A. H.	Wahpeton
Rice, C. P.	Wahpeton
Sasse, E. G.	Lidgerwood
Thompson, A. M.	Wahpeton

SHEYENNE VALLEY MEDICAL SOCIETY

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SECRETARY-TREASURER	
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Almkloy, L.	Cooperstown

Brown, Fred	Valley City
Campbell, Wm.	Valley City
Macdonald, A. C.	Valley City
Macdonald, A. W.	Valley City
Meredith, C. J.	Valley City
Moore, Will H.	Valley City

Platou, C. A.	Valley City
Pray, E. A.	Valley City
Van Houten, J.	Valley City
Westley, M. D.	Cooperstown
Wicks, F. L.	Valley City
Zimmerman, S. A.	Valley City

SIXTH DISTRICT MEDICAL SOCIETY

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Arnsen, J. O.	Bismarck	Griebenow, F.	Bismarck	Roan, M. W.	Bismarck
Baer, DeWitt	Steele	Halliday, A. B.	Hebron	Rogne, W. G.	McClusky
Benson, O. T.	Glen Ullin	Hamilton, E. E.	New Leipzig	Rosenberger, H. P.	Bismarck
Berg, H. M.	Bismarck	Heinzroth, Geo.	Turtle Lake	Schoregge, C. W.	Bismarck
Bertheau, H. J.	Linton	Henderson, R. W.	Bismarck	Shepard, W. B.	Linton
Brink, N. O.	Bismarck	Hetzler, A. E.	Mandan	Smith, C. C.	Mandan
Bodenstab, W. H.	Bismarck	LaRose, V. J.	Bismarck	Smith, L. G.	Mandan
Brandes, H. A.	Bismarck	Larson, E. J.	Underwood	Spielman, G.	Mandan
Brandt, A. M.	Bismarck	Larson, L. W.	Bismarck	Stackhouse, C. E.	Bismarck
Buckingham, T. W.	Bismarck	Lipp, G. R.	Bismarck	Strauss, F. B.	Bismarck
Bunting, F. E.	Mandan	Monteith, G.	Hazelton	Thompson, R. C.	Wilton
Constans, G. M.	Bismarck	Moyer, L. B.	Carson	Vonnegut, F. F.	Hague
Diven, W. L.	Bismarck	Nickerson, B. S.	Mandan	Waldschmidt, R. H.	Bismarck
Eastman, L. G.	Hazen	Owens, P. L.	Bismarck	Weston, D. T.	Mandan
Fisher, A. M.	Bismarck	Pierce, W. B.	Bismarck	Weyrens, P. J.	Hebron
		Quain, E. P.	Bismarck	Whittemore, A. A.	Napoleon
				Williams, Maysil	Bismarck

SOUTHERN DISTRICT MEDICAL SOCIETY

PRESIDENT		Fergusson, F. W.	Kulm	Miller, S.	Ellendale
Sherman, C. H.	Oaks	Grant, G.	Wishek	Ribble, G. B.	LaMoure
SECRETARY-TREASURER		Kyle, W. D.	Havana	Salvage, F. E.	LaMoure
Lynde, Roy	Ellendale	Lynde, R.	Ellendale	Sherman, C. H.	Oakes
		Merrett, J. P.	Marion		

SOUTHWESTERN DISTRICT MEDICAL SOCIETY

PRESIDENT		Gilsdorf, W. H.	New England	Murray, K. M.	Scranton
Gilsdorf, W. H.	New England	Gumper, A. J.	Dickinson	Nachtwey, A. P.	Dickinson
SECRETARY-TREASURER		Gumper, J. B.	Belfield	Olesky, E.	Mott
Spear, A. E.	Dickinson	Hamernek, F.	Elbow Woods	Patterson, S.	Rhame
Bowen, J. W.	Dickinson	Heffron, M. M.	Dickinson	Perkins, G. A.	Dickinson
Bradley, W. C.	Beach	Hill, S. W.	Regent	Reichert, H. L.	Dickinson
Chernauek, S.	Dickinson	Law, I. M.	Halliday	Rodgers, R. W.	Dickinson
Cornelius, F. J.	Bowman	Lemieux, D.	Stanley	Schumacher, N. W.	Hettinger
Dach, J. L.	Reeder	Lyons, M. W.	Beach	Smith, Oscar	Killdeer
Dukart, C. R.	Richardton	Maercklein, O. C.	Mott	Spear, A. E.	Dickinson
		Morris, V. G.	Beach	Williams, M. W.	Hettinger

STUTSMAN COUNTY MEDICAL SOCIETY

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Conrad, J. L.	Jamestown	Carpenter, G. S.	Jamestown	Matthaei, Pearl	Jamestown
SECRETARY-TREASURER		Conrad, J. L.	Jamestown	Melzer, S. W.	Woodworth
Brainard, Bertha B.	Jamestown	Culbert, M. H.	Courtney	Nierling, R.	Jamestown
Arzt, P. G.	Jamestown	DePuy, T. L.	Jamestown	Peake, Francis	Jamestown
Brainard, Bertha B.	Jamestown	Fergusson, V.	Gackle	Robertson, C. W.	Jamestown
Cabot, S.	Jamestown	Gerrish, W. A.	Jamestown	Sorkness, J.	Jamestown
Carr Agnes Thorpe	Jamestown	Holt, G. H.	Jamestown	Wood, W. W.	Jamestown
		Karterman, M. R.	Lake Williams	Woodward, F. O.	Jamestown

TRAIL-STEELE COUNTY MEDICAL SOCIETY

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Vinje, Syver	Hillsboro	Knutson, O. A.	Buxton	Vinje, Syver	Hillsboro
		Little, R. C.	Mayville		

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Crawford, John	New Rockford	Donker, A. E.	Carrington	Meadows, R. W.	Carrington
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Boyum, P. A.	Harvey	LaPointe, Jos. P.	Harvey	Van de Erve, H.	Carrington
		MacLachlan, C.	San Haven	Westerveldt, A. E.	Bowden

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Alger, L. J.	Grand Forks	Drew, G. F.	Devils Lake	Hill, S. W.	Regent
Almklov, L.	Cooperstown	Dukart, C. R.	Richardton	Hjelle, C. A.	Portland
Arneson, A. O.	McVelle	Durkee, C. A.	Abercrombie	Hoepfer, P. G. E.	Williston
Arneson, C. A.	Bismarck	Dyson, R. E.	Minot	Hofto, J. M.	Grand Forks
Arnson, J. O.	Bismarck	Eastman, L. G.	Hazen	Holt, G. H.	Jamestown
Arzt, P. G.	Jamestown	Elofson, C. E.	Fargo	Horsman, A. T.	Devils Lake
Aylen, J. P.	Grafton	Engesather, J. A. D.	Brockett	Hoskins, J. H.	Wahpeton
Baer, DeW.	Steele	Ehrenfeld, H. M.	Minot	Hunter, G. W.	Fargo
Baillie, W. F.	Fargo	Evans, L. J.	New York	Huntley, H. B.	Kindred
Barnes, N. J.	Fargo	Fardy, M. J.	Minot	Irvine, V. S.	Park River
Bartle, J. P.	San Haven	Fawcett, J. C.	Devils Lake	Ittkin, P.	Tolley
Bateman, C. V.	Wahpeton	Fawcett, N. W.	Devils Lake	Ivers, G. U.	Fargo
Beithon, E. J.	Hankinson	Fawcett, W. C.	Starkweather	James, J. B.	Page
Benson, O. T.	Glen Ullin	Fergusson, F. W.	Kulm	Jelstrup, C.	Big Lake, Minn.
Benson, T. Q.	Grand Forks	Fergusson, V. O.	Gackle	Johnson, J. A.	Bottineau
Bentzen, Olaf	Grand Forks	Fergusson, W. C.	Fargo	Johnson, P. O. C.	Watford City
Benwell, H. D.	Grand Forks	Field, A. B.	Forest River	Joistad, A. H.	Fargo
Berg, H. M.	Bismarck	Fisher, A. M.	Bismarck	Jones, C. S.	Williston
Blatherwick, W. E.	Van Hook	Fjelde, J. H.	Fargo	Kaess, A. J.	Fargo
Bertheau, H. J.	Linton	Flaten, A. N.	Edinburgh	Karterman, M. R.	Lake Williams
Bodenstab, W. H.	Bismarck	Floew, A. T.	Fargo	Kemphorne, C.	Minot
Boerth, E.	Buffalo	Ford, F. W.	Minnewaukan	Kermott, L. H.	Minot
Borland, V. G.	Fargo	Fortin, H. J.	Fargo	Kjelland, A. A.	Hatton
Bowen, J. W.	Dickinson	Fortney, A. C.	Fargo	Knutson, O. A.	Buxton
Boyum, P. A.	Harvey	Foster, G. C.	Fargo	Kolb, F. K.	Granville
Bradley, W. C.	Beach	Fredricks, L. H.	Bismarck	Krogstad, L. T.	Minot
Brainard, Bertha	Jamestown	Freise, P. W.	Bismarck	Lampert, N. T.	Minot
Brandes, H. A.	Bismarck	French, H. E.	Grand Forks	Lancaster, W. E. G.	Fargo
Brandt, A. M.	Bismarck	Frogner, G. S.	Parshall	Landers, C. H.	2469 N.
Bray, R. B.	Fargo	Gaebe, O. C.	New Salem		Holliston Ave., Altadena, Calif.
Breslich, P. J.	Minot	Garrison, M. W.	Minot	Landry, L. H.	Walhalla
Brink, N. O.	Bismarck	Gerdes, Maude M.	Minneapolis, Minn.	LaPointe, J. P.	Harvey
Brown, Fred	Valley City			LaRose, V. J.	Bismarck
Brown, R. C.	Fargo	Gerrish, W. A.	Jamestown	Larson, E. J.	Underwood
Brown, W. G.	Fargo	Gillespie, D. R.	Mohall	Larson, G. A.	Fargo
Buckingham, T. W.	Bismarck	Gilsdorf, W. H.	New England	Larson, L. W.	Bismarck
Bunting, F. E.	Mandan	Gaspel, G. W.	Grafton	Laugeson, L. L.	San Diego, Calif.
Burton, P. H.	Fargo	Glaspel, C. J.	Grafton	Law, H. W. F.	Grand Forks
Cabot, G. S.	Jamestown	Goehl, R. O.	Grand Forks	Law, T. M.	Halliday
Call, A. M.	Rugby	Goodman, R.	Powers Lake	Lees, H. D.	Philadelphia, Pa.
Campbell, R. D.	Grand Forks	Gordon, W. L.	Washburn	Leigh, R. E.	Grand Forks
Campbell, W.	Valley City	Goss, E. L.	Carrington	Lemieux, D.	Stanley
Cameron, A. L.	Minot	Graham, J. D.	Devils Lake	Lewis, T. H.	Fargo
Carpenter, G. S.	Jamestown	Grangaard, H. O.	Ryder	Liebele, W. A.	Grand Forks
Carr, Agnes Thorpe	Jamestown	Grant, G.	Wishek	Limburg, M.	Fargo
Carr, A.	Minot	*Grassick, James	Grand Forks	Lipp, G. R.	Bismarck
Carr, Andy M.	Minot	Greengard, M.	Cando	Little, R. C.	Mayville
Carr, J. D.	Jamestown	Griebenow, F. F.	Bismarck	Lohrbauer L. T.	Grand Forks
Chernauek, S.	Dickinson	Gumper, A. J.	Dickinson	Long, W. H.	Fargo
Clay, A. J.	Fargo	Gumper, J. B.	Belfield	Longstreth, W. E.	Kensal
Conrad, J. L.	Jamestown	Haagensen, E. C.	Grand Forks	Lyle, W. D.	Havanna
Constans, G. M.	Bismarck	Halliday, A. B.	Hebron	Lund, A. B.	Leeds
Cornelius, F. J.	Bowman	Halliday, D. J.	Kenmare	Lynde, R.	Ellendale
Countryman, G. L.	Grafton	Halverson, H. L.	Minot	Lyons, M. W.	Beach
Countryman, J. E.	Grafton	Hamernek, F.	Elbow Woods	McGouern, T. E.	Velva
Cowan, J. A.	Flaxton	Hamilton, E. E.	New Leipzig	McCannel, A. D.	Minot
Craven, J. P.	Williston	Hammargren, A. F.	Harvey	McGee, W. J.	Flaxton
Crawford, John	New Rockford	Hanna, J. F.	Fargo	McGurren, C. J.	Devils Lake
Culbert, M. H.	Courtney	Hanson, G. C.	Minot	McIntosh, J. G.	Devils Lake
Cuthbert, W. H.	Hillsboro	Haroldson, O.	Minot	McQueen, W. W.	Langdon
Dach, J. L.	Reeder	Hardy, M. A.	Minto	Macdonald, A. C.	Valley City
Dalager, N. O.	Anamoose	Haugen, H.	Fargo	Macdonald, A. W.	Valley City
Darrow, Frank I.	Fargo	Haugrud, E. M.	Fargo	Macdonald, J. A.	Cando
Darrow, K. E.	Fargo	Hayhurst, J. O.	Rolette	MacGregor, M.	Fargo
DePuy, T. L.	Jamestown	Haynes, G. H.	Lisbon	MacLachlan, C.	San Haven
Devine, J. L.	Minot	Heffron, M. M.	Dickinson	Maercklein, O. C.	Mott
Dillon, J. G.	Fargo	Heimark, A. J.	Fargo	Mahon, R. M.	Grand Forks
Diven, W. L.	Bismarck	Heinzroth, G. E.	Turtle Lake	Matthaei, D. W.	Fessenden
Dochterman, L. B.	Williston	Henderson, R. W.	Bismarck	Matthaei, Pearl V.	Jamestown
Dodds, G. A.	San Haven	Hendrickson, G.	Enderlin	Mattson, R. H.	McVile

* Honorary

Meadows, R. W.	Carrington	Quain, E. P.	Bismarck	Sorkness, J.	Jamestown
Melzer, S. W.	Woodward	Quain, F. D.	Bismarck	Spear, A. E.	Dickinson
Meredith, C. J.	Valley City	Quale, V. S.	Grand Forks	Spielman, G. H.	Mandan
Merrett, J. P.	Marion	Radl, R. B.	Bismarck	Stackhouse, C. E.	Bismarck
Miller, H. H.	Wahpeton	Ramstad, N. O.	Bismarck	Stafne, W. A.	Fargo
Miller, H. W.	Casselton	Rand, C. C.	Crystal	Stickelberger, Josephine	Oberon
Miller, J. P.	Grand Forks	Ransom, E. M.	Minot	Stolinsky, A.	Lisbon
Miller, S.	Ellendale	Rasmussen, F. P.	Beulah	Strauss, F. B.	Bismarck
Moffatt, G.	Crosby	Reichert, H. L.	Dickinson	Stromberg, G. E.	Langdon
Monteith, G.	Hazleton	Reiswig, A. H.	Wahpeton	Swanson, J. C.	Fargo
Moore, J. H.	Grand Forks	Ribble, G. B.	LaMoure	Tainter, Rolfe	Fargo
Moore, W. H.	Valley City	Rice, C. P.	Wahpeton	Thompson, A. M.	Wahpeton
Morris, A. C.	Fargo	Rice, P. F.	Solen	Thompson, A. Y.	Larimore
Morris, V. G.	Beach	Richter, E. H.	Hunter	Thompson, R. C.	Wilton
Moyer, L. B.	Carson	Rindlaub, E. P.	Fargo	Timm, J. F.	Makoti
Mulligan, T.	Grand Forks	Roan, M. W.	Bismarck	Tompkins, C. R.	Grafton
Mulligan, V. A.	Langdon	Robertson, C. W.	Jamestown	Toomey, G. W.	Devils Lake
Murray, K. M.	Scranton	Rodgers, R. W.	Dickinson	Tronnes, N.	Fargo
Muus, H. O.	Grand Forks	Rogne, W. G.	McClusky	Vance, R. W.	Northwood
Nachtwey, A. P.	Dickinson	Rollefson, C. J.	Crosby	Van de Erve H.	Carrington
Needles, A. S.	Grafton	Rollie, C. O.	Drake	Van Houten, J.	Valley City
Nelson, L. F.	Bottineau	Rose, N. J.	Finley	Verret, B. D.	Rollo
Nichols, A. A.	Fargo	Rosenberger, H. P.	Bismarck	Vigeland, J. G.	Brisbane
Nichols, W. C.	Fargo	Rostel, H.	Fargo	Vinje, S.	Hillsboro
Nickerson, B. S.	Mandan	Rothnem, T. P.	Fargo	Vonnegut, F. F.	Hague
Nierling, R. D.	Jamestown	Rowe, P. H.	Minot	Wagar, W. D.	Michigan
O'Brien, L. T.	Wahpeton	Ruud, M. B.	Grand Forks	Waldren, H. M., Jr.	Drayton
Odegard, B.	Mayville	Rystad, O. H.	Grand Forks	Waldren, H. M., Sr.	Drayton
Oftedal, A.	Fargo	Salvage, F. E.	LaMoure	Waldschmidt, R. H.	Bismarck
Olafson, K.	Cando	Sand, O.	Fargo	Watson, E. M.	Fargo
Olesky, E.	Mott	Sasse, E. G.	Lidgerwood	Weed, F. E.	Park River
Olson, C. T.	Wyndmere	Savre, M. T.	Northwood	Weeks, S. A.	Ambrose
Orr, August	Bismarck	Schatz, G.	West Fargo	Weible, R. E.	Fargo
O'Neill, R. T.	Minot	Schoregge, C. W.	Bismarck	Westervelt, A. E.	Bowdon
Ostfield, J. R.	Fargo	Schumacher, N. W.	Hettinger	Westley, M. D.	Cooperstown
Owens, C. G.	Sheyenne	Schwinghamer, E. J.	Grenora	Weston, D. T.	Mandan
Owens, P. L.	Bismarck	Sedlacek, B. B.	Ft. Totten	Weyrens, P. J.	Hebron
Panek, A. F.	Milton	Sedlak, O. A.	Fargo	Wheelon, F. E.	Minot
Pangman, W. J.	Riverside, Calif.	Seibel, J. J.	Harvey	Whitemore, A. A.	Napoleon
Patterson, S.	Rhame	Seiffert, G. S.	Minot	Wicks, F. L.	Valley City
Patterson, T. C.	Lisbon	Shepard, W. B.	Linton	Widmeyer, J. P.	Rollo
Patterson, C.		Sherman, C. H.	Oakes	Williams, Maysil	Bismarck
Fargo Veterans Hospital, Fargo		Sihler, W. F.	Devils Lake	Williams, M. F.	Hettinger
Peake, F. M.	Jamestown	Skarshaug, H. J.	Fargo	Williamson, G. M.	Grand Forks
Peake, M. F.	Grand Forks	Skelsey, Albert W.	Fargo	Winn, W. R.	Fargo
Pence, J. R.	Minot	Skovholt, H. T.	Williston	Witherstone, W. H.	Grand Forks
Pence, R. W.	Minot	Smith, C.	Devils Lake	Wood, W. W.	Jamestown
Perkins, G. A.	Dickinson	Smith, C. C.	Mandan	Woodward, F. O.	Jamestown
Pierce, W. B.	Bismarck	Smith, J. A.	Noonan	Woutat, P. H.	Grand Forks
Platou, C. A.	Valley City	Smith, LeRoy G.	Mandan	Wright, W. A.	Williston
Pray, E. A.	Valley City	Smith, O. M.	Killdeer	Yoemans, T. N.	Minot
Pray, R. E.	Fargo	Sorenson, A. R.	Minot	Zimmerman, S. A.	Valley City

The Fiftieth Anniversary of the North Dakota State Medical Association

A. W. Skelsey, M.D.

Fargo, North Dakota

IN CONNECTION with the proposed celebration, our historian, Dr. James Grassick, was requested to give for the anniversary a review of some of the leading events affecting the medical world during our 50 years of history. He kindly but truthfully replied that he had already collected much historical data for us, especially that concerning the State itself, and that now

it was the duty of some others to add their quota. As he fails to pass along his "torch" to us, we must first remind you of the very valuable and interesting material to be found in his first volume of *North Dakota Medicine*. None of us can equal him in suitable language and vivid description of the pioneer days. To the younger medical generation we earnestly commend his

book that they may appreciate fully the lives and the experiences of those Dakota pioneers.

Now, in contrast, modern hospitals, improved methods and accessories for treatment of the sick and the maimed, rapid transportation by automobiles and airplanes, and concrete roads mean commercial and professional death to some of the formerly prosperous small towns. Stronger competition meets the individual physician in those smaller locations, due to easier access to the clinics and the hospitals of the larger towns. Seemingly, the general practitioner is being edged out of the professional race. So, also, does North Dakota itself encounter these changed conditions, in that today by quick and comfortable modes of transportation the North Dakotans travel on to yet larger clinics and to more noted doctors beyond our borders.

Supplemental to Dr. Grassick's book, should you desire to consider other events affecting the profession here and in the country at large, we submit the following facts for your consideration: In the year 1880 the northern portion of the Territory of Dakota contained 36,305 persons, excluding Indians. In 1887 was created what now constitutes the State Medical Association. North Dakota was not legally separated from the southern portion of the Territory until 1889, when there came into existence the present divisions of North and South Dakota. Therefore, our society preceded by two years the birth of North Dakota. According to the old records, politically the birth of these twins was accompanied with great travail; some of the quarrelsome subjects concerned the attempt to intrude into North Dakota the Louisiana Lottery of national fame, and the attempt also to introduce strong State prohibition of liquor.

Our present population is about 675,000. We have no large cities. Agriculture is practically our only resource financially, and unless the farmers, upon whom we are all dependent, can get good prices for their products, we all experience financial distress. On the other hand, having no large industries, we are fairly free from the serious labor troubles prevailing in commercial and textile centres. Owing to the unusually severe droughts which we have experienced for several years past, very many thousands of our Dakota families are now "on relief," furnished through such agencies as the Federal Resettlement Administration, the WPA, *et cetera*. The former department has been very helpful, coming to the rescue often where the WPA workers have been released on account of severe climatic conditions or unassigned appropriations for the latter class of workers. Through the aid of our own Committee on Medical Economics and the efforts of one of our medical men then on the State Welfare Board we have been able to effect an arrangement with such organizations and certain counties whereby there has been adopted a minimum fee schedule for the physicians caring for those on relief. Just at present, there is no regular doctor on our State Welfare Board, but we hope some arrangements may be made for such representation there.

The past half century has greatly modified and enlarged the fields of medicine. Now there are decided

divisions into such subjects as internal medicine, surgery, gynecology, obstetrics, orthopedics, and other specialties, with newly created organizations for the careful examination of persons claiming specialty. For many years practically all of our states have had medical examining boards conducting rigorous general medical examinations, or, in lieu thereof, accepting reciprocal certificates from states properly accredited. A recent addition to the plan has been the inclusion of a fourth day practical examination. We now have the National Board of Medical Examiners, a body comparable to similar systems in Great Britain. The fortunate holder of a diploma from our National Board is usually admitted to any of our states on reciprocal basis.

Our two-year medical school connected with the University in Grand Forks was organized in 1905. It requires for admission to its first-year class three years of collegiate work. The total number of students is restricted to between 50 and 60. Nearly all of its graduates have done well in the other medical schools where they have gone to complete the final two years. They have succeeded in scholarship as well as professionally. Due to our very severe droughts of recent years the medical department has not received from the legislatures all of the appropriations deemed necessary by the American Medical Association's Council on Medical Education. That Council has removed our medical school from its list of approved institutions. Representatives from our State Medical Association will appear before that Council in June, 1937, to urge the American Medical Association to modify its action, particularly in view of the fact that, despite our very straightened circumstances, our last legislature increased its appropriations. Of course large buildings and expensive laboratories are of great value, but under present conditions in this section of the country, scholarship and successful professional careers should also have much weight with the Council. Proper acknowledgment is duly accorded to that national society and to its councils, yet they should also clearly realize that, even with fairly moderate physical equipment, the medical schools of a few decades ago did valuable work and sent out many talented practitioners to successful careers.

Universities, Medical Schools, Foundations and Endowments

There has been a great change, not only in other secular education, but also in the field of medicine. The heavy requirements placed upon medical colleges to fit them for the highest rating have caused the disappearance of the very low and the medium grade medical schools. Vast sums of money have been given to private and collegiate-grade institutions by individuals or have been secured from trust funds. Most liberal appropriations have been granted by state legislatures, so that now their medical schools, as well as those of the private or denominational colleges, have obtained international recognition. This is a decided contrast to that of only a few years ago, when foreign authorities gave recognition

to but a few of our schools. A résumé of some notable foundations, gifts and institutions is appropriate here.

John D. Rockefeller, who died May 23, 1937, alone contributed for educational and other philanthropic purposes a sum amounting to over \$530,853,632 from 1855 to 1934. Included in this were gifts as follows:

The University of Chicago \$34,708,375, The Rockefeller Institute for Medical Research \$59,931,891, The Rockefeller Foundation \$182,851,480, The General Education Fund \$129,209,167, The Laura Spielman Rockefeller Memorial \$73,985,313, The Baptist Church, over \$20,000,000. Part of these gifts, as can be seen, went to medical education or research.

A few decades ago a southern institution with a denominational background was offered a million or two provided it become secular; the arrangement went through, and the university now has an imposing group of medical buildings. The increased wealth and the vast number of buildings of many of our colleges and universities are the marvels of the age. Note the attendance at some of those listed below:

	Attendance, 1932
New York University, a private institution ..	40,665
Northwestern University, Evanston- Chicago. Private	14,562
Boston University. Private	14,611
Carnegie Inst. of Technology. Private	5,262
College of the City of New York. Municipal	26,293
Columbia, New York. Private	37,808
Duke University. Private. 99 years old, but fairly recently endowed by the Duke To- bacco Estate, \$20,000,000	2,658
Emory University. Private. 100 years old, but removed several years ago from a small town into Atlanta, Ga. Endowed	2,051
Fordham University. Private	8,754
George Washington University, Washington, D. C. Private	8,585
Harvard University. Private	8,536
University of Chicago. Private	7,613
University of Pennsylvania. Private	15,800
Western Reserve. Private	9,043
Washington University. Private	7,355
Yale University. Private	5,388
University of Pittsburgh	14,342
Iowa State College of Agr. & Mech. Arts. State	13,753
State University of California	19,235
State University of Illinois	14,986
State University of Michigan	15,500
State University of Minnesota	13,864

The University of Pittsburgh is now celebrating its 150th birthday, just completing its new home, the Cathedral of Learning, a skyscraper of 42 stories, costing about \$20,000,000. Nearby is its noted medical centre. Columbia of New York City has its 183rd Commencement. Awards about 4,500 degrees, diplomas and certificates. The two great medical centres in New York City are said to represent each an outlay of \$50,000,000.

The Regular Medical Profession and the Irregulars

We continue to have a serious surplus of regular doctors, despite gradually increasing admission and graduation requirements. Failing to gain admission to our own medical schools, a large number of students are now going to Europe for their medical work.

Many of our doctors are affiliated with the local, state, and national medical organizations. The American Medical Association now has a membership of 105,460 physicians—the largest in its history. In North Dakota, out of the total number of regular doctors, our Society enrolls about 400 annually.

The Eclectic medical system is not now prominent. They have a medical college in Cincinnati. Homeopathy has gone off the main highway. When one does encounter a homeopathic physician, he usually is utilizing regular medical procedure and medication. There is a homeopathy medical school in Philadelphia, and one in New York City. There are now only five state Homeopathy Medical Examining Boards. Those state universities which a few decades ago furnished separate medical schools for homeopaths have abandoned such distinction and added expenses; about the only vestige left of this system may be a notice in the catalogue offering a few lectures on homeopathic medicine.

The only separate college for women medical students, so far as we know, is the Woman's Medical College in Philadelphia. The past year that institution graduated 33 women, compared with 213 medical females from coeducational colleges. The total number of women practitioners keeps fairly constant. There are now 1133.

The chiropractors constitute a later eruption from osteopathy. Alleging that they are the latest scientific product they doubtless consider themselves of the elect. Their entire lack of modesty in crying their wares and their own merits is stated to have been augmented by the clever advertising section of their "colleges." The human spinal column must bring in much cash income to these sectarians. In violation of the laws under which they are working, they are trespassing very decidedly into fields not their own.

The osteopaths have veered greatly from the old-time definition of their healing art, *i. e.*, that of relieving impinged nerves which caused all diseases. Now they advertise teaching colleges giving instruction in all subjects to be found in the regular medical schools. They have been enabled in several states to obtain recognition giving them practically all of the rights and privileges of the regular profession.

In practically all states, in and out of legislative seasons, vigorous and politically-influenced attempts are made by various of these irregulars, attempting to secure legal recognition of such vagaries as naturopaths, sanipractors, *etc.* Much money is spent by them in these efforts.

Growth of Wholesale Pharmaceutical Establishments

While this has in many ways been beneficial to our profession and also affords efficient and scientific means of securing biological and other products under Federal supervision, it has developed a high pressure and very effective method of getting not only before the doctors themselves, but also to the public, the dentists and the irregulars, samples of all types of medication. Not infrequently, so far as the physician is concerned, the pharmacist passes out to the patrons thousands of such samples duly labeled with copyright or trade names. The magnitude of mass publicity is well shown by an advertisement of a large proprietary firm in the *American Druggist* for May, 1937, stating that the firm will, during the year, "publish 427,785,583 advertisements in the consumers' magazine and newspapers."

Hospitals have increased greatly in size, numbers, and superior equipments; they are now more freely utilized by the public, especially as compared with the patronage of earlier periods. Economic conditions have induced them individually and in groups, to offer to the public for 21 days hospitalization at a yearly cost of \$10.00.

Radios affect the medical profession. Utilized very freely by quacks of all description, from small-fry up to noted cancer-cure fakers. Offsetting this, to some extent, have been the discussions by some competent medical men.

The automobile and the air-plane, as stated above, have materially changed our mode of life. On the wrong side of the ledger is the astounding death rate from automobile accidents; last year the number killed was about 38,000, and to this must be added the many thousands of accidents due to automobiles.

Birth control, in these very modern and hectic years, is freely bandied about. Conflicting views arouse angry discussions and pamphlets. Cass County Medical Society tackled the proposition and voted in favor of it, and, in addition, has arranged for local parlors affording instruction in its technique.

The open and very free discussions about euthanasia clearly indicates the tendencies of these years. In England lately an attempt was made to legalize the practice of "mercy-deaths," but the measure failed of adoption in Parliament. Also, in Nebraska this year, the bill introduced was squelched.

Mass movements now aim to eradicate diseases of all types. While the medical profession has always been alert to help in the cause of preventive medicine, it seems that in later years there is a tendency toward undue interference by outside agencies seeking to exploit the doctors and thus gradually causing friction and apprehension regarding probable "state medicine".

One is told that our population has swung so far from Victorian restraints and prudery that many are headed downwards to the lowest depths of immorality. The nation's well-meant plan of national prohibition against liquors did not succeed; hence the saloon, the booze, and the barmaids are back with us. The for-

merly legally restricted prostitution districts have been declared inhumane and revolting to mankind as well as affording *nidi* for fearsome diseases and later divorces; therefore, the old-time red light areas have been submerged into the residential and the business blocks. The movie films and movieland itself have become so extreme in depicting erratic and erotic lives, that some of the religious denominations have been compelled to protest, the Catholic Church especially. Pornographic literature is allowed to pass through the mails and is avidly publicly read by many persons, who only a few years ago would not be bold enough to do so. Perhaps as a result of these modern happenings comes from Dr. Parran of the U. S. Public Health Service and also from the Health Department of New York City the warnings that very many thousands of persons are afflicted with syphilis, and demands of an immediate mass movement against that disease. They also urge the regimentation of all physicians and social agencies in the support of the Federal and local services expected to be given.

Fifty years ago in this country, very few women smoked, at least publicly. Now, at the risk of being called upon for exact data, we may feel safe in saying that at least one-third to one-half of the female sex openly and defiantly puff some form of tobacco. Thousands and thousands of dollars are spent by manufacturers of tobacco, especially of cigarettes, in the most gorgeous and glamorous manner, to urge on the number of addicts. At intervals a modern Jeremiah travels along modern routes, claiming that in "research work" he had found traces of nicotine in the mammary glands and the nipples of pregnant and lactating mothers. But who, after reading and seeing the advertisements describing the benefits from smoking ensuring guaranteed energy and "poise", would object to a slightly nicotinized maternal lacteal outflow? Indicating the liberal opinions of these years, the North Dakota legislature has now withdrawn the former legal restrictions against smoking in restaurants and other public resorts.

And after these almost 50 years of questionable state and local prohibition, all intoxicants are permissible here. We dare not here try to give an estimate of the liquor habits in this part of the country more than to say that there are much fewer liquor prescriptions given by doctors now that prohibition is non-existent. As a rule, however, during the Federal restrictions, there were not many of our doctors who, by issuing excessive liquor prescriptions, violated the laws. Now that there are so many deaths and thousands of accidents due to automobiles, the National Council of Safety's slogan is: "When you drink, don't drive."

Federal, state and local laws governing pure foods and drugs, the sanitation and safety of factories, mines, etc.; quarantine; child labor regulations; shorter hours of employment; reporting of contagious diseases; compulsory vaccinations and immunizations; Federal and local control of narcotics and their distribution have had their influence on medicine and induced better control of disease. Tuberculosis, small-pox, diphtheria, yellow fever and other diseases are not now nearly so

prevalent. Diabetes, while still one of the leading diseases, has been controlled better since the discovery and the use of insulin. Syphilis is now being treated by more modern methods and medications, and here the arsenicals give most excellent results. Poliomyelitis is yet a serious menace, especially in epidemics; nor has yet any definite specific been found for it. Among the diseases heading the death columns are cancer, heart disorders, pneumonia, and appendicitis. The recent advent of sera treatment in some types of the pneumonias seems to offer hope. The advance in anesthesia, general and local, has been notable. There are now many surgeons who do the major portion of their work under spinal anesthesia. The modern use of the endocrines and the fairly recent development of the theories regarding the vitamins has

evolved a prodigious amount of literature, including probably much advertising and exploitation by large chemical concerns and some physicians. Out of this mass of claims and advertisements, there have come some fairly well proved values. As usual, the laity come in on this with self-medication resulting.

As a substitute for an allegedly great improvement over the older sedatives, enter the barbiturates backed with great vigor and advertisements by the proprietary concerns. From prescriptions and possibly some free samples the public is now well informed regarding these drugs, and freely purchases them over the counters. Drastic legislation should be enforced, to prevent the indiscriminate use of such drugs. But can the druggist be reformed?

Epidural and Subdural Hemorrhages

Thomas S. P. Fitch, M.D.

Plainfield, New Jersey

IN COLLEGE ATHLETICS, head injuries are not at all unusual. The most frequent type encountered is simple cerebral concussion in which the patient is merely dazed or shows a transient period of unconsciousness.

Fortunately, the grave type of head injury, which we meet in automobile accidents and industrial accidents, is not often encountered as a result of competitive sports. This type is manifested by a sudden and profound coma which persists and is accompanied by a rapid pulse and slow but continuous rise of temperature. These patients do not present signs of increased intracranial pressure and almost invariably end fatally. At autopsy, multiple minute punctate hemorrhages are found scattered throughout the white substance of the brain and frequently small hemorrhages are present in the mid-brain, pons and medulla.

The treatment of this class of patients at the present time is entirely unsatisfactory. You are undoubtedly familiar with the treatment of ordinary head injury, consisting of simple concussion or contusion of the brain, by shock measures followed by dehydration and spinal punctures.

There is a great difference of opinion as to the treatment of these cases. Each exponent of a particular method claims the best results by his pet theory.

I will skip over this group of cases and dwell upon the class of epidural and subdural hemorrhages. This class presents the most serious outlook of the group of head injuries encountered in college athletics. They are not extremely rare and should be thought of and carefully excluded in all cases coming under the observation of college physicians.

I should like to present a short series of such cases as a clinical talk and attempt to point out significant signs and symptoms by which these localized hemorrhages can be diagnosed.

In the entire field of serious head injuries, the recognition and treatment of subdural and epidural hemorrhages offers the greatest responsibility to the attending physician. The physician who recognizes this important group and proceeds with the proper surgical treatment will have a great deal of satisfaction. These cases are often dramatic in their rapid return to consciousness and it is remarkable how function is restored in these critically ill patients who present themselves with excruciating headache and perhaps convulsions or hemiparesis.

Subdural and epidural hemorrhages will eventually cause the death of the patient if not treated surgically. The delayed diagnosis made at autopsy table is a real tragedy and we can recall such cases with much chagrin. Many of these cases are lost because the condition is not thought of.

At times newspaper accounts of the train of events which have followed an accident very graphically describe the cardinal symptoms of this condition. We will read of a patient being taken to a hospital in an unconscious condition and the next day will be told by the newspaper that the patient has regained consciousness and is expected to recover. At a later date the newspaper informs us that a paralysis has occurred and then we learn that the patient has again lapsed into coma and finally we read the death notice. This is the typical sequence of events.

This picture (Figure 1) is taken at autopsy of a middle-aged gentleman who went to a chiropractor in Elizabeth. The chiropractor proceeded to adjust his cervical vertebrae and gave him a severe thrust on the

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Fig. 1. Subdural hemorrhage.

back of his neck. He immediately lost consciousness and was kept in the office for about an hour until he regained consciousness. He complained of a severe headache but was put in a taxi and sent to his home in Roselle. That afternoon, he lapsed again into coma and a regular practitioner was called who immediately sent him to Muhlenberg Hospital by ambulance. On his arrival at the Hospital, a head injury was suspected and I was called. Before I arrived, the man had died, and through the courtesy of Dr. Brokaw, the county physician, I performed the autopsy which shows the condition pictured here. There is a massive hemorrhage in the subdural space which shows no lamellation. This case illustrates several important points: 1st, it shows that a trivial injury may be the cause of a subdural hemorrhage; 2nd, it shows that the force was applied in the posterior anterior direction of the skull. This is a common factor; 3rd, it presents the typical lucid interval which is highly characteristic; 4th, it illustrates the rapid death which may follow a subdural hemorrhage.

Subdural hemorrhages are most often produced by a rupture of an unsupported cerebral vein as it leaves the cortex of the brain to enter the longitudinal sinus in the region of the vertex. This explains why a blow on the occiput or the frontal region is most apt to produce these lesions. It is also important to determine whether the patient's head was stationary or in motion at the time of the impact. It is more apt to occur when the head is the moving object and is suddenly stopped by the impact against an immovable object. In such a case, the brain is in motion and the skull is suddenly retarded, causing the brain to slide in a sagittal direction and thus tear one of the small emissary veins. I recall a case of Mr. W. P., 75 years old, admitted to Muhlenberg Hospital March 14th, 1931, who was struck by an automobile. He had been stunned; but quickly regained consciousness. Examination showed abrasion of the left occipital region and the X-ray showed a linear fracture of the occipital bone. His spinal fluid pressure was increased and the fluid contained free blood. His right pupil was dilated and he was unconscious on admission. His reflexes were increased and he had a bilateral

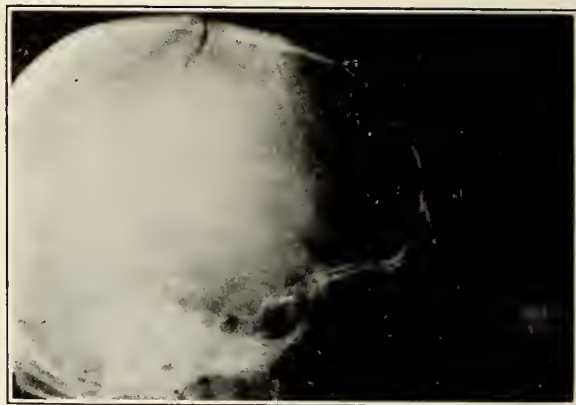


Fig. 2. Linear fracture across vortex of skull.

Babinski. When I saw him, he was deeply unconscious and showing Cheyne-Stokes respiration and he died within a few minutes. Dr. Brokaw again permitted me to examine his brain and I found a linear fracture of the left occipital bone extending downward lateral to the foramen magnum toward the petrous bone. The left lateral cerebellar lobe showed a contusion about 3 inches in diameter with subarachnoid hemorrhage. The interesting feature of this autopsy was a contracoup laceration and contusion of the anterior pole of the right cerebral hemisphere with a massive subdural hemorrhage. This case illustrates very well the mechanism of the contracoup injuries to the brain. Subdural hemorrhage may be due to a laceration of a cortical artery, as it was in this patient, through a laceration of the brain. If the bleeding is arterial in origin and especially if accompanied by a laceration of the brain, the coma is sudden in onset and the case progresses rapidly to a fatal termination. If the symptoms progress more slowly, we can then assume that the origin of the hematoma is venous in origin.

Dr. B. M. Vance¹, from his invaluable experience as assistant medical examiner of the City of New York, reports that subdural hemorrhage accounted for 26% of the deaths of the 507 cases of fractured skull in his series. In that number, he found a subdural hematoma of sufficient size to produce increased intracranial pressure. He records the fracture in these cases most frequently in the posterior portion of the skull and in numerous instances there was a contracoup brain injury causing the hemorrhage. He states that subdural hemorrhage below the tentorium is rare and insignificant. He also calls attention to the relation of contracoup injuries and the head being in motion at the moment of impact. Last spring, I had two boys of the same age in Muhlenberg Hospital who demonstrated this fact. One of the boys fell from a limb of a tree while watching a baseball game and struck his head on a flagstone beneath the tree. He showed an extensive depressed fracture in the right parietal region, was deeply unconscious and showed focal signs pointing to the left cerebral hemisphere. The second boy was catching at baseball behind the bat and sustained a severe blow in the right parietal region from a powerful swing of the



Fig. 3. Encephalogram. Normal position of ventricles.

batter. His X-ray showed practically an identical depressed fracture in the right parietal bone. The first boy ran a very stormy course of coma and a period of irrationality and irritability before his eventual recovery, while the second boy dropped unconscious immediately on receiving the injury but soon recovered consciousness and made a completely uneventful recovery. In the first case, the head was in motion and the lad received a severe contracoup injury, while the second lad's head was at rest and the trauma was entirely local and confined to the right side.

Epidural hemorrhage has many points of similarity with subdural hemorrhage as far as the symptomatology is concerned. Again quoting Dr. Vance, who reports that epidural hemorrhage is rare in children and is most frequent in patients between 30 and 40 years of age. The reason for this is that the middle meningeal artery is not canalized in the skull in early youth. Of epidural hemorrhage, which constitute about 12% of deaths from fractured skulls, the middle meningeal artery was the one most frequently ruptured but the lateral sinus accounted for some.

This X-ray picture (Figure 2), is from G. O. V., age 20 years, a parachute jumper of the U. S. Navy, who was admitted to Middlesex Hospital on June 13th, 1933. He was riding his motorcycle from Pensacola, Fla., to the Brooklyn Navy Yard and was upset and hurtled through the air, head foremost, against a tree. He was dazed but had recovered consciousness on admission to



Fig. 4. Shift of ventricles in extradural hemorrhage.

the hospital and complained of severe headache. This X-ray was taken by Dr. Avery with a portable machine. I saw him two days later and found the patient very drowsy but could be aroused and was cooperative. He complained of an excruciating headache in the frontal region and pain back of his eyes. My examination showed bilateral choking of his optic discs, contracted but equal and active pupils, the left abdominal reflex was easily exhausted, the right remaining active. He showed a definite weakness of both lower extremities and positive Babinski. His chart showed his temperature was 99, pulse 52, respiration 14, which is suggestive of intracranial pressure. I did a spinal puncture and to my amazement, the mercury rose to the 50 mm. mark. The fluid was clear. I withdrew the needle immediately. It is very unusual to have such a high acute pressure with a conscious patient. It does occur in chronic pressure of tumors but seldom in acute head injuries. I immediately took him to the operating room and used local novocaine anesthesia instead of general anesthesia because of this high intracranial pressure. I made a horse-shoe incision with the base posterior right over the depressed fracture area and reflected the skin flap. The fracture line was exposed with its depression and I made an osteoplastic flap across the mid-line over the vertex. On reflecting the bone, a large extradural blood clot was evacuated from both sides. The patient stated that there was instant relief of his headache when the bone flap was elevated and he brightened up and laughed and



Fig. 5. Fracture crossing middle meningeal artery.

joked with us through the remainder of the operation. I scooped out large firm clots from both sides, returned the bone flap to its place and left two rubber tissue drains, one on each side. We typed him and that evening gave him 310 cc. of blood by transfusion. Three days later, his temperature was 99, pulse 80, respiration 20. The weakness of the extremities was improved and he was bright and cheerful. Six days later the sutures were removed and the skin flap had healed by primary union. Ten days later he was discharged to the Naval Hospital in Brooklyn in good condition.

Our next case was A. J., 35 years old, admitted to Muhlenberg Hospital February 11th, 1933, from injuries received in an automobile accident. She was knocked unconscious but had regained consciousness on her admission to the Hospital and was complaining of a severe right-sided headache. She was admitted at 2:30 P. M. and I saw her at 10:30 P. M., 8 hours later. She was very stuporous, but could be aroused and complained of a severe headache. Her eyes showed a deviation toward the right. A slight left facial asymmetry. The left abdominals were absent and the deep reflexes were increased on the left side. Her spinal fluid pressure was 28 mm. of Hg., and bloody fluid present. There was a weakness of the grip of the left hand. My note on her chart reads, "... with a history of unconsciousness immediately following the accident, with recovery of consciousness, and now lapsing back into coma, I advise an immediate operation and search for middle meningeal bleeding." We had had no X-rays so far, and we did not delay the operation at that hour to have them taken. We took her to the operating room immediately and opened the right side of her skull, and through the first drill hole in the bone a black clot exuded. On opening further, an extensive extradural clot was evacuated. I elevated the brain and exposed the foramen spinosum and plugged it. A fracture was seen at the base of the skull running into the foramen spinosum. I opened the dura and a large amount of bloody cerebro-spinal fluid spurted out. A drain was inserted and the wound closed in layers. Eight days after the operation, the sutures were removed and the wound was completely healed. Her temperature, pulse and respirations were practically normal throughout.

She made a complete recovery from all her neurological signs and was discharged 15 days later. I have seen her in my office several times since and each time she has no subjective complaints, saying that she believes she feels better since her injury than she did before it.

The next case was an Italian, who was in an automobile accident, admitted to Muhlenberg Hospital November 28th, 1930, unconscious and recovered consciousness within 24 hours. He showed a dilated and fixed left pupil. His reflexes were all sluggish. Abdominals and Babinski absent and he developed an engorgement of his retinal vessels, ending in papilledema. The X-ray showed a fracture, crossing the left middle meningeal artery. His spinal fluid pressure was 30 mm. of Hg. and the fluid was bloody. This man continued to be irrational and highly irritable for several days, resembling a post-traumatic psychosis, frequently running up and down the hospital corridor in the abbreviated hospital nightgown. His spinal fluid pressure showed no tendency to come down under continued drainage and dehydration treatment, so I finally decided to operate for middle meningeal hemorrhage on the side of the fracture and the dilated pupil. The subtemporal area was exposed and a large extradural clot removed. The middle meningeal artery was plugged at the foramen spinosum. This man returned from the operating room an entirely different individual. It was difficult to believe that he was the same man. He was so quiet, docile and cheerful. He made a good immediate post-operative recovery. Unfortunately, he became involved in a series of difficult court trials over the litigation of his accident and in February, 1932, I was called to see him. The family said that he had been paralyzed on the left side of his body and had been unable to leave his bed for more than a week. I examined him and found no neurological signs of an organic lesion. The paralysis had been on the same side of the body as his head injury and by suggestion therapy, I had him up walking about on my first visit. I wanted to be certain that he had no hemorrhage on the opposite side and so admitted him again to Muhlenberg Hospital for encephalography—(Figure 3). You will see by his picture that there is no deviation of the ventricles and his spinal fluid pressure was found to be normal. You can readily see the importance of this procedure in determining whether the symptoms in this case were organic and the value that these pictures are in court.

In this next case, I applied encephalography as an early diagnostic procedure. E. L., 32 years old, was admitted to Muhlenberg Hospital May 18th, 1931. This boy was riding a motorcycle two days before when he was involved in an accident in which he was dazed from a head injury. He got on his motorcycle and returned home complaining of a severe headache and lapsed into coma. He recovered from his coma at intervals in the next two days but each time returning to the unconscious state. The X-ray of this skull on admission, showed a fracture in the right side of the skull crossing a middle meningeal blood vessel groove. This boy had no ab-

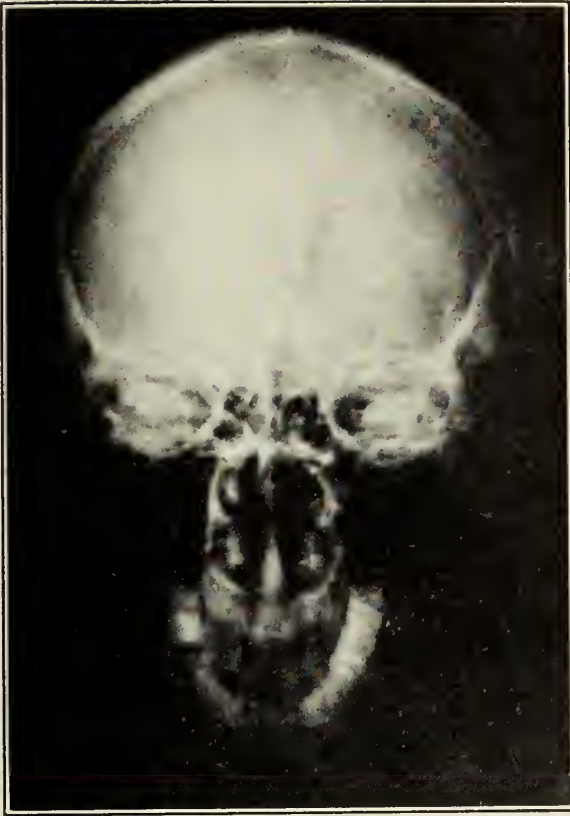


Fig. 6. Encephalogram in extradural hemorrhage.



Fig. 7. Encephalogram in subdural hemorrhage.

normal neurological signs other than intermittent coma and we found the spinal fluid pressure increased to 30 mm. of Hg. and blood-tinged fluid present. On dehydration, his spinal fluid pressure came down to 22 but gradually returned to 26 and he developed edema of his optic discs. Because of the paucity of focal signs, I performed an air injection through the lumbar route and, as you see here, (Figure 4), there is a displacement of the ventricles toward the left side with a partial obliteration of the anterior horn of the right lateral ventricle. I made a temporal opening in his skull and found a large extradural hemorrhage in the right frontal region which was evacuated. This boy made a good post-operative recovery with practically normal temperature and pulse and was discharged eleven days after his operation and has remained in perfect health to the present time.

Our next patient is a girl of 20 years, M. R., who entered Mühlenberg Hospital February 14th, 1933. She had been injured in an automobile accident, rendering her unconscious, and was brought to the Hospital in a stuporous condition. The patient was drowsy, but could be aroused. She showed no focal neurological signs. Her spinal fluid pressure was 18 mm. of Hg. and bloody fluid present. Her X-ray examination of the skull by Dr. Boyes, showed a vertical fracture on the left side in the anterior parietal region (Figure 5), extending from the vertex to the base. Dehydration treatment and continued spinal punctures failed to reduce her pressure and on

the 17th of February she was still complaining of severe headache in the right parietal region. The left abdominal reflex was more active than the right. Her pupils were equal and no other neurological signs could be elicited so I resorted to encephalography and you see here (Figure 6) that after the air injection there is an absence of air over the left hemisphere with the shifting of the ventricles toward the right side. Because of these findings, in conjunction with the fracture reported by Dr. Boyer, I took her to the operating room on the 17th. I made an opening in the left temporal region and on opening the bone, a large extradural blood clot was found in the frontal region. I evacuated the clot, elevated the dura and clipped the middle meningeal artery in the foramen spinosum. This girl made an uneventful recovery, running a temperature of not more than 100 post-operatively and was discharged the 31st day after the operation. She has remained perfectly well until the present time with the exception of slight numbness in the second division of the trigeminal nerve which was inadvertently injured during the exposure of the foramen spinosum. There has been no pain connected with this.

The careful examination of the visual fields may be of localizing value as in the following case: C. Y. was referred by Dr. Boyer of Clinton from the N. J. Reformatory. The boy had fallen from a truck and had made a good immediate recovery from what seemed a trivial head injury. Weeks later he complained of severe

headaches and appeared apathetic. His eye grounds showed choked discs and his visual fields demonstrated a homonymous hemianopsia of the opposite side. Dr. Boyer sent the boy to the infirmary at Skillman under Dr. Dan Renner, where I operated upon him on March 8th, 1931. I opened his right temporal region and found an epidural blood clot. Sixteen days later, on March 24th, he was discharged in good condition. The point well exemplified by this boy was the importance of taking the visual fields in localizing the pressure of the blood clot.

This last case is a patient of Dr. Hegeman's, who was injured on August 16th, 1932. While walking on the road, he was struck by a car. He was unconscious for a few minutes and was not orientated on admission to Somerset Hospital. Examination showed a swollen area over the occiput. The X-ray showed no fracture of the skull. He was irrational in the early part of his stay in the hospital, getting out of bed, and appearing in a dazed condition. His spinal fluid showed the presence of blood and he complained of headache. On September 1st, 1932, he was discharged mentally clear. On his return home, his mother states that he was somewhat irritable and showed clumsiness on the left side of the body. On October 16th, 1932, he had an attack of headache and vertigo, with projectile vomiting through the night. The next morning the patient had a complete left-sided hemiplegia—the arm more involved than the leg, and a drooping of the left side of the mouth. The left pupil was larger than the right. On October 20th, the patient was taken with a convulsion more marked on the left side and unconscious for 1½ hours. I saw him in consultation with Dr. Hegeman on November 22nd, 1932, at which time he showed a left spastic hemiplegia, with no voluntary motion on the left side of the body. A left central facial weakness and a conjugate deviation of the eyes to the left and deviation of the tongue to the left. There was hypalgesia and astereognosis of cortical type on the left side of the body, more marked in the distal part of the extremities. Pain and vibratory sense were normal. He obliged us by going into a Jacksonian convulsion of the left side with deviation and nystagmus to the left. His spinal fluid pressure was 18 mm. of Hg. and an air injection was performed (Figure 7). I diagnosed a subdural hemorrhage in the right fronto-parietal region and operated the next day. A right fronto-parietal osteoplastic flap was turned down and on reflecting the dura, a large hematoma with a thick capsule was present over the right cerebral hemisphere, the greatest volume appearing in the frontal region. The clot was evacuated and the membrane removed and the boy made a good post-operative recovery, the power returning to the upper

and lower extremities and the facial paresis disappeared. The unusual part of this case was the fact that his spinal fluid showed a positive Wassermann and this suggests the diagnosis of pachymeningitis hemorrhagica interna.

Pachymeningitis hemorrhagica interna is a similar condition which occurs in general paresis, chronic alcoholism, senile dementia and wasting diseases. This term is reserved for those cases in which no traumatic history is obtained. I believe that if a true history were known the number of these cases would be materially reduced. The pathological process of these diseases eventually gives a brain atrophy, so that the cortical emissary veins are elongated and put under a greater strain, so that a very trivial injury could rupture them easily. In addition, these patients have a notoriously poor memory and their trauma is readily forgotten.

In the differential diagnosis, I will mention only one condition which is rather rare. That is fat embolism² which occurs after fractures of the long bones. The symptoms are similar to the subdural and epidural hemorrhages. There is a lucid interval, hemiplegia, monoplegia and a rise of temperature. The history of fracture of the long bones, the absence of marks of cranial injury, the cutaneous hemorrhages, similar to bacterial endocarditis, and fat droplets in the sputum and urine render the diagnosis possible³.

In looking back over these cases, we find that of the focal signs, probably the most constant is a dilated fixed pupil. Also the unilateral absence of abdominal and cremasteric reflexes with a positive Babinski or Oppenheim. The central facial weakness, choked discs, and the increased spinal fluid pressure which does not improve under dehydration measures. There is a characteristic type of respiration which resembles that of sound sleep. The expiratory phase is exaggerated. The coma is apt to be intermittent. They are mentally dull and drowsy in the lucid intervals.

In summarizing, I should like to emphasize the following points to guide us: 1st, the lucid interval with perhaps a trivial injury; 2nd, a careful history of the circumstances of the accident and the location of the injury; 3rd, headache, drowsiness and coma; 4th, focal signs, such as dilated pupils, monoplegia, hemiplegia, visual field defects or Jacksonian attacks; 5th, persistent increased intracranial pressure; 6th, the value of encephalography as a final court of decision in obscure cases.

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Treatment of Pneumonia *

Evaluation of Modern Methods

H. Corwin Hinshaw, M.D., Ph.D.**

Rochester, Minnesota

IT IS WISE to pause occasionally and take inventory of our therapeutic armamentarium. Enthusiastic specific claims are made for several methods of treatment in pneumonia. Protagonists easily leave the erroneous impression that their method is of such value that previously established treatments may be abandoned.

The treatment of pneumonia cannot be standardized, for pneumonia is not a standard disease. The term "pneumonia" is a pathologic concept and one essentially synonymous with pulmonary consolidation. This unique phenomenon is dependent upon the peculiar course of acute inflammation in a spongy air-containing organ. It may be caused by a variety of organisms and may follow divergent clinical courses.

The erratic and often unpredictable clinical course of pneumonia renders judgment of therapeutic methods especially fallacious. The dramatic crisis of lobar pneumonia may spontaneously appear very early and be falsely attributed to efforts at treatment. The result has been repeated, baseless therapeutic claims. Conversely, it took more than ten years to prove conclusively to conservative physicians the value of specific serum therapy.

Let me, then, very briefly offer opinions on the present status of several currently popular methods of treatment for pneumonia:

Oxygen Therapy

Anoxemia is a characteristic feature of most serious cases of pneumonia. The appearance of cyanosis is clear evidence of insufficient oxygenation of the blood and is a definite indication for oxygen therapy. Properly administered oxygen can overcome moderate degrees of anoxemia. The cyanosis, dyspnea, tachycardia and mental symptoms of severe pneumonia are largely due to anoxemia and resemble those due to oxygen lack in "mountain sickness" or in experimental oxygen deprivation. The restlessness, delirium, apprehension, and air hunger of pneumonia may be dramatically relieved by oxygen. Temperature, pulse and respiration rates are consistently reduced.

Oxygen is best administered in a modern oxygen tent which also has the virtue of air-conditioning. Physician and nurse must clearly understand the construction and adjustment of the mechanism. It is essential that frequent analysis of the gaseous content of the tent be made. The technic of analysis is not difficult and may be accurately carried out by a laboratory technician, using the convenient apparatus now available.

Oxygen may be administered by nasal catheter when the oxygen tent is not available. Milder degrees of an-

oxemia may be overcome by this method. It is simple, inexpensive, and sometimes surprisingly effective.

Serum Therapy

Serum therapy has passed the experimental stage and must be accepted as an effective weapon against certain varieties of pneumonia. It is rarely justifiable to use antipneumococcus serum without bacteriologic classification of the causative organism. The greatest recent advance in specific therapy has been the perfection of the rapid, simple Neufeld method of typing pneumococci. This has been made universally available by the marketing of complete typing outfits by several firms.

The effectiveness of Type I antipneumococcus serum has been well established. Properly used in suitable cases it may be expected to cut the mortality in half. Type II antipneumococcus serum appears to be somewhat less effective, but its use is clearly indicated in Type II pneumonia. With the subdivision of Group IV into specific types there have appeared other types for which sera may be prepared.

The cost of serum therapy is the greatest handicap to its unlimited use in private practice. So far, it has chiefly been used where special funds were available to bear this burden. The average case will require from \$100 to \$200 worth of serum at present prices.

The effectiveness of serum therapy is multiplied by early administration, and it is not wise to delay its use "to see if it should become necessary." A positive blood culture of Type I or Type II pneumococci renders serum therapy nearly obligatory. Sepsis is a common cause of death in pneumonia, and serum therapy is the only effective weapon against it.

Artificial Pneumothorax

Pneumothorax treatment of lobar pneumonia remains in the experimental stage. It has not been accepted by many conservative physicians. Its use should be restricted to medical centers and to those thoroughly acquainted with the technic and complications of artificial pneumothorax. It appears to relieve pleural pain and it is claimed that artificial crisis may be precipitated. It should not be used after the third day of lobar pneumonia, and it is contraindicated in bilateral disease and probably in bronchopneumonia.

Medical Diathermy

The early claims of diathermy treatment have not been realized. It may conspicuously relieve pleural pain, and its effects seem to be mainly restricted to the chest wall. It has not been proved that the lung can be significantly heated by diathermy. Diathermy appears to be harmless when properly administered, and if available may well be tried when pleurisy does not respond to

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** Division of Medicine, the Mayo Clinic, Rochester, Minnesota.

simpler measures. There is no proof that the course of pneumonia is altered, or that the mortality is reduced, by diathermy.

Chemotherapy

There is reason to hope that chemists and physicians now engaged in intensive research may yet give us effective drugs against the pneumococcus. Antistreptococcal drugs are now available for clinical trial, but their place in medicine remains to be determined.

Postoperative Pneumonia

Pneumonia following surgery is unique in several respects and deserves separate consideration. Surgery affords opportunity for aspiration and dissemination of infectious material. At the same time it seriously hampers aeration and pulmonary drainage. In addition to the usual treatments one must strive to keep the post-operatively infected lung aerated and drained. During the first day or two before extensive consolidation has occurred, aeration is facilitated by voluntary deep breathing exercises and by the forced hyperventilation induced by inhalation of carbon dioxide. Drainage of the lung is encouraged by urging voluntary coughing and by reducing the use of sedative drugs as much as possible. Sometimes a Trendelenburg position for postural drainage is indicated.

Nursing Care

The death or survival of the pneumonia patient frequently depends upon the skill and judgment of his

nurse. Physical and mental comfort, minimal handling and disturbance, symptomatic treatment, maintenance of fluid balance, control of distention and every effort to conserve the patient's natural resources, play significant rôles. Every patient who is seriously ill with pneumonia belongs in a hospital whose facilities for study and care materially increase his chance of survival.

Symptomatic Treatment

The physician's therapeutic skill is often severely taxed by efforts to control the symptoms of severe pneumonia. Sedatives are often indispensable, for strength must be conserved. Expectorants are indicated when the sputum is thick and difficult to dislodge, but they must be wisely chosen to avoid gastric distress. Digitalis is indicated only in cardiac failure. Distention must be controlled by enemas, even laxatives, and, rarely, by pituitrin. Alcohol may be of some benefit, especially for aged patients or alcoholics.

Conclusions

Mortality rates in pneumonia may be significantly reduced by more widespread and judicious use of modern therapeutic agents. No single method is complete; "specific" therapy does not release one from the necessity of using every available symptomatic remedy. Pneumonia may be an acute medical emergency and require the organized services of a modern hospital, laboratory, and trained nursing staff.

Missed Abortion *

W. F. Mercil, M.D.

Crookston, Minnesota

THE general misconception of the meaning of the term "missed abortion" and its more frequent occurrence than is usually believed, coupled with personal observation of some cases in recent years, has prompted my interest in this subject. In the search of literature to learn of the experience of others, one finds few complete articles written on this subject. This discussion briefly reviews some of the general features of missed abortion and also reports four cases.

Terminology

Most writers agree to the definition of Duncan, "The death of the fetus before term with general symptoms of abortion and failure of the uterus to expel its contents within the usual time."¹ Rongy² defines it as follows: "Intrauterine death of the fetus, with its complete retention and absence of progressive enlargement of the uterus." To avoid confusion, it should be remembered that spontaneous abortion differs in this respect in that uterine expulsion is usually within a few days, while in missed abortion it may not occur until many weeks or

months later. It is generally believed that expulsion of the fetus six weeks after its death is the limit of time in consideration of the term "spontaneous abortion."

Etiology

There are two factors concerned in the etiology. Primarily, the death of the fetus has been explained in many cases to be due to trauma to the abdominal wall. However, such evidence is lacking in a great number of instances. Schwartz³ considers abnormality of the cord to be of frequent occurrence in such cases. The failure of the fetal death to occur in many severe types of organic disease leads one to the belief of some endocrine unbalance as being a causative factor. Secondarily, the non-expulsion of the dead fetus has not been satisfactorily explained. Lack of uterine muscular irritability, perhaps caused by ingrowth of chorionic villi into the muscle wall, has been advanced by some writers as an etiological consideration.

Medico-legal Significance

The question of abdominal trauma to the pregnant woman, with subsequent signs of abortion and disappearance of these symptoms with retention of a dead fetus

*Read before the Annual Session of the Northern Minnesota Medical Association, held at Fergus Falls, Minnesota, August 31-September 1, 1936.

to be expelled perhaps months later, is one to be kept in mind by those engaged in expert testimony.

Recurrence

It is interesting to note that few cases have been reported in the literature of the recurrence of this condition. Litzenberg¹ reported one case of missed abortion occurring twice in two years, as did also Machenhauer¹. In one of the cases which I am reporting, the same incident occurred. No satisfactory explanation has been offered why this situation should repeat itself.

Diagnosis and Symptomatology

In the usual history, there occur signs of a threatened abortion, which subside. The patient has a feeling of security that the danger of an abortion is passed. Close observation will reveal that the uterus ceases to enlarge and that regressive changes occur in the breasts. Also, cessation of fetal movements and a foul vaginal discharge may cause these patients such concern that they seek medical advice. The latter symptom has been the most prominent one in our experience which brings these cases to the attention of the medical attendant. There may occur irregular vaginal bleeding, but this symptom is usually not common. Some authors have also reported the incidence of a general feeling of malaise and chronic disability in this class of patient⁵. However, the greater percentage tolerates the dead fetus remarkably well. In fact, so good has been the health of many that they may carry the product of conception for years. Smith⁴ reported two cases, one of 11 years and another of 12 years' duration. Frequently, the diagnosis can be made on past history of the patient when one considers that the size of the fetus passed does not coincide with the supposed month of pregnancy. A negative Aschheim-Zondek or Friedman test is also of value. The condition most frequently mistaken for missed abortion is fibromyoma, especially if the tumor is soft and of an even contour. Amenorrhea may occur for three or four months, but the subjective symptoms of the first trimester are usually absent.

Prognosis

The outlook is usually good. Spontaneous expulsion occurs frequently. The fetus is usually macerated, following, perhaps, weeks of foul vaginal discharge. Commonly, mummification takes place. This phenomenon occurred in all of our cases. Of the reports in the literature, most of the cases have terminated in one of these two manners. Undoubtedly, in many cases, the uterine contents would be expelled sooner or later, but, in some cases, spontaneous expulsion does not take place when the retained product of conception is well organized and is strongly adherent to the uterine wall. At times, resorption of the fetal soft tissue alone, or of total absorption, including the skeletal structures, may take place. Danforth and Paddock reported one incident of total absorption of all fetal tissue, with an easily recognized cord and placenta left intact. Calcification of the fetus is rare. Smith⁴ reported a case of calcification of the uterus, resulting from the fetal bones cutting their way

into the muscular layer. The occurrence of superimposed pregnancy in missed abortion is extremely rare. Forster's⁶ case was one in which death of the fetus occurred at the fifth month. A superimposed pregnancy took place the following month, and nine months later a normal live fetus and a dead five months' fetus were delivered by Caesarian section.

Treatment

In the light of what has already been stated, evacuation of the uterine contents is the first consideration of therapy. Given a case in which diagnosis is in doubt, it is best to make two examinations a month apart, noting definitely the lack of increase or the decrease in size of the uterus. One may elect to wait for spontaneous termination when no untoward symptoms arise, or when close observation can be maintained in a healthy patient. However, two months' time of watchful waiting should be sufficient to accurately determine death of the fetus.

Evacuation of the uterine contents early in pregnancy can best be accomplished by dilatation and curettage. This is usually done when the cervix is soft and the fetus lies on the lower uterine segment. A long, rigid cervix requires a more radical procedure, vaginal hysterotomy. One must bear in mind while doing a dilatation and curettage in missed abortion that the uterine wall is usually thin and may be easily ruptured. Stein⁷ reports this incident occurring in one case in which the fetus had passed into the vesico-uterine space. There also occurs a more firm fixation of the retained embryo to the uterine wall, making the incidence of rupture a strong possibility. When mummification has occurred, the fixation is apt to be quite firm, and in such instances repeated curettages may be successful in removing the fetal tissue. Medical induction of uterine contractions by the means of castor oil, quinine and pituitary preparations are practically useless and some mechanical or operative intervention is necessary. Results were obtained, however, by the use of pituitrin alone in one of my cases, due to the fact that some uterine contractions had occurred before the introduction of the drug. After the uterus has been emptied, it is well to keep a close watch on the amount of bleeding, as it has been definitely shown that severe hemorrhage is more likely to occur because of poor contractility of the uterine muscle. Thus a uterine packing is often indicated. Introduction of bags and manual removal has been the method used successfully by some.

A new light on therapy has recently been reported by Robinson⁸ and his associates. This is the employment of the estrogenic substances. They report 80 per cent successful results in evacuating the uterus in missed abortion by this method. They explain this on the basis of the sensitizing factor, estrin, which, when given intramuscularly, sensitizes the uterus to contract or elicits a prompt response with pituitrin. They believe the patient has the discomfort of intramuscular injections, but that she is immune from the danger of uterine trauma, infection, and hemorrhage. However, the expense of this product, together with the uncertainty of its successful

results, makes one hesitate to employ this method routinely.

Case Reports

Case 1: Mrs. A. L., age 33 years, para two, gravida three, seen on April 8, 1931, with the history of her last menstrual period dating January 15, 1931. The calculated date of delivery was October 13, 1931. She had no complaints, and the size of the uterus corresponded to three months' pregnancy. She was seen again June 6th, the uterus approaching the size of a five months' pregnancy. She had no complaints. At her next visit on July 23rd, she stated that she had ceased feeling the fetal movements, and that she twice had had a slight bloody vaginal discharge with cramps in her lower abdomen similar to those at her menses. Examination at this date revealed a uterus that more nearly approximated a four months' pregnancy. There was no history of trauma dating between these two visits. One week later, July 30th, she passed a mummified fetus, 12 cm. in length, corresponding to that of a three and a half months' fetus. She has since passed through a normal pregnancy.

Case 2: Mrs. J. S., age 37, para three, gravida four, was seen on October 27, 1933, her last menstrual period occurring on August 26, 1933. Except for nausea and vomiting, she had been feeling well. The uterus was slightly enlarged. She was not seen again until December 9th, at which time examination revealed a uterus the size of a four months' pregnancy. There were no complaints nor any unusual features of her pregnancy at this time. The next visit was January 27, 1934, at which time she stated that she felt well, but had had a slight bloody vaginal discharge for the past three days with no pain. The uterus was somewhat smaller than at the previous visit. On February 17, 1934, she had had a continuation of the same bleeding, which, in the last week, had assumed a brownish red color and a foul odor. Examination revealed a uterus the size of a three months' pregnancy, while her menstrual history would indicate one of about six months. A diagnosis of missed abortion was made. By dilatation of the cervix and the use of a placental forcep, the mummified fetus 11 cm. in length was delivered.

Case 3: Same patient. She had felt well when seen more than a year later on May 23, 1935. Her last menstrual period occurred on March 15, 1935. The uterus was slightly enlarged, and a diagnosis of a presumable pregnancy was made. She was seen again one month later, June 25th, at which time she had no complaints,

and the uterus was definitely increased to the size of a three months' pregnancy. She was not seen again until three months later, on September 11th, at which time she stated that she felt well, but had had no signs of life for the past six weeks, and also that she had begun to pass a foul reddish-brown discharge from the vagina. She had slight pains in the lower abdomen at this time. Examination revealed a uterus the same size as on the previous visit, and the cervix was found gaping with membranes presenting. She was hospitalized, given two injections of pituitrin, and the next day spontaneously aborted a mummified fetus, similar in size and length to the previous one. This patient presented much the same clinical features and result in this pregnancy as she did in the one preceding.

Case 4: Mrs. H. P., age 31, a primipara, was first seen on July 15, 1935. Her menstrual periods had been regular and the last period dated May 5, 1935. Her past history was negative except for a mild hypothyroidism which was well controlled by thyroid extract. Previous examinations had revealed a uterus, infantile in type, and at this examination, a positive diagnosis of pregnancy from the size of the uterus alone was difficult. However, at her next visit one month later, the uterus had enlarged considerably and was then at about the three months' size. On October 22nd, she stated that she felt well and had no complaints. The uterus now increased to that of a five months' pregnancy. She was seen next on November 8th, at which time she stated that for the past two weeks she had not felt any more fetal movements. The uterus was apparently the same size as on the previous visit. Fetal heart sounds were not heard. On December 12th, after passing a brownish discharge for two days, she spontaneously aborted a mummified leathery fetus of about five months' size. This time corresponded to her seventh month of pregnancy.

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THE MINNESOTA DEFENSE PLAN

Medical men will have no desire to dispute the decision of committees of the American Bar Association who decided recently that the medical defense plan of the Ohio State Medical Society constitutes the unauthorized practice of law.

The professional ethics of law and medicine have much in common and their preservation is vitally important to the welfare and advancement of both.

The Ohio medical association agreed to submit its case to the Committees on Professional Ethics and Grievances of the Unauthorized Practice of Law and is, therefore, bound by their decision.

Other state associations are not so bound but will readily bow to the decision of the Bar association. The decision will be accepted as a precedent by which other defense plans will be judged and attorneys will rightly refuse to associate themselves with any similar plan.

Minnesota has no medical defense plan, as such, having abandoned medical defense as a state association activity a good many years ago.

Its present plan for aid to members who are threatened with malpractice litigation in no way impinges upon the practice of law.

Unlike the Ohio plan, the Minnesota plan calls for no aid in court from the association, no counsel and no payment of fees of counsel retained by members who are threatened with suit.

Ohio's plan, in operation when the case arose, called for a standing medical defense committee which was to have the advice and assistance of the general counsel of the association. The committee was authorized to contribute to the cost of defense, to cooperate in making investigations and obtaining witnesses, to recommend legal counsel if requested to do so and to extend such other aid and support as the committee found to be practicable and proper.

Although the medical association assumed no obligation, it ordinarily re-imbursed the defendant physician for the amount of legal services, provided the counsel employed cooperated with the committee and the general counsel in handling the suit. This cooperation consisted in submission of full facts and information in the case with copies of briefs and pleadings so that general counsel could make intelligent and helpful suggestions. It was not required that the counsel for the defendant physician follow the suggestions.

Minnesota's Medical Advisory Committee is merely advisory. It investigates facts and otherwise assists member physicians if such assistance is deemed proper but it does not provide legal defense for anyone. Its object, instead, is the avoidance, as far as possible of actual malpractice litigation.

In so doing it is regarded by the Bureau of Legal Medicine of the American Medical Association as entirely within its rights and will not therefore be affected by the bar association decision.

J. A. M.

THE DOCTOR'S VACATION

Whether you go on a "holiday" or a "vacation" depends largely on the place whence you came. If you are of British extraction, it is likely that you will tenaciously cling to the former; and if you are not, you will simply *vacate* your usual haunts, cease your daily pursuits, and seek some *divertissement* that shall promote forgetfulness of routine, toil, and care; and build up strength and resistance for the monotonous grind that you must look forward to upon your return.

To the mind, restricted by the limitations that our native provincialisms impose, holidays suggest festivities and dress parades, while vacations are preeminently periods of change and repose in bathing suits, fishing togs, and old clothes. If the doctor makes any such distinction, then his excursions and side trips on attending conventions satisfy the holiday craving; but for a truly restful vacation he must get away from telephones, that have become very exacting in his daily life, and the modern turmoil that adds exasperation.

Some of our distinguished friends have contrived to annex as one of the perquisites of their exalted station in life the right to a sort of *de luxe* vacation, impressively termed "sabbatical leave." This might be a propitious time for the organization of a movement in the interest of physicians, who are of necessity on duty every Sunday of the year, to get recognition by some such high-sounding name. It should somehow point out to the public the constant vigil of the profession, lest the multitude begrudge the interlude. Shall we say, "The doctor is taking his annual sabbath?" A. E. H.

THOMAS MULLIGAN

1877-1937

Another heart has ceased to beat, another noble spirit has taken its flight and another empty space is left among the stalwarts of our profession.

Dr. Thomas Mulligan was born in Dublin, Ontario, March 23, 1877, and passed away at Grand Forks, North Dakota, July 19, 1937. He was educated in the public and high schools of Ontario, and graduated from the medical department of the University of Toronto in 1904. He came to Grand Forks, North Dakota, and was licensed October 13, 1904. After practicing for two years he took post-graduate work at London, Edinburgh, Berlin and Vienna. Returning to Grand Forks he resumed practice and by strict attention to duty became favorably known over a large area. In 1908 he was married to Miss Margaret McQuaid of Seaforth, Ontario, who survives. His home life was exemplary and beautiful, each through mutual concern contributing to the others happiness.

Dr. Mulligan was recognized by his professional associates as a gentleman of high ideals and worthy purposes. He was above-board, honest and ethical with his fellows and expected like consideration from others. He kept himself fully abreast with the latest in medical progress but never allowed himself to be carried away by the untested claims of enthusiasts or the visionary

whims of the hour. Dr. Mulligan deserved well of the profession and he was honored by being elected president of the State Medical Association in 1927. He also served as president of the Grand Forks District Medical Society. He had been a member of the American College of Surgeons since 1926. Dr. Mulligan was an engaging companion, grateful of favors, courteous at all times and with a fine sense of quaint humor that was contagious.

For the past several years he was less well physically than has been generally known. As a physician he gave to his patients the best he had of learning, skill, care, and sympathy, and received in full measure their confidence and esteem. As his physical energies waned this earnest and intense application drew heavily on his reserve. At intervals he found it expedient to get away from work for periods of rest and recuperation. Like another valiant knight he would say: "I'm wounded but not slain. I'll lay me down and rest a while and then I'll rise and fight again." That was the character of the man; and from these breathing spells he would come back refreshed and eager to carry on. Nature, however, sets her limitations and says, "Thus far shalt thou go." When an acute heart attack supervened, the silver cord gave way and all that was lovable of Doctor Mulligan departed and he was at rest.

Dr. Mulligan was a splendid type of an American citizen and physician. He was loyal to his country and its institutions; upright in dealing with his fellow-men; public-spirited in community affairs; faithful and generous to the Church of his choice; devoted to home, family and friends; and true to the profession he loved and honored.

J. G.

SOCIETIES

Annual Meeting of the Northern Minnesota Medical Association Virginia, Minnesota August 27th and 28th, 1937 Speakers' Program

1. L. F. Hawkinson, Brainerd—"The Menopause Syndrome."
2. H. D. Harlowe, Virginia—"Bronchoscopy as an Aid to the General Practitioner."
3. Gage Clement, Duluth—"X-Ray Therapy in Non-Malignant Conditions."
4. Frank Hirschboeck, Duluth—"Heart" (Movie).
5. C. I. Krantz, Duluth—"Gastro-Intestinal Allergy."
6. George Earl, St. Paul—"The Comparative Values of Injection and Surgical Treatment of Herniae."
7. J. C. Michael, Minneapolis—"Insulin Shock Therapy in Schizophrenia (Dementia Precox)."
8. J. A. Bargen, Rochester—"Conditions Causing Intestinal Obstruction and Their Management."
9. H. J. Lillie, Rochester—"Certain Considerations of the Faucial Tonsil in General Practice."
10. A. W. Adson, Rochester—"Essential Hypertension; the Indications For, and the Results of Extensive Sympathectomy."

11. Robert M. Burns, St. Paul—"Rating of Disabilities."
 12. R. G. Leland, Chicago—Director, Bureau of Medical Economics, American Medical Association.
 13. B. J. Branton, Willmar—"Medicine: A Coöperative Business, A Non-Competitive Profession."
 14. Hon. N. H. Debel, St. Paul—"The Physician and the Workman's Industrial Commission Compensation Law."
 15. Philip C. Reynolds, Minneapolis—"The Medical Witness."
- John F. Fee, Duluth—*Discussion*.

Banquet Program, August 27th

Toastmaster—Dr. Frank J. Hirschboeck, Duluth.

Address—"The Wonderland of Lake Superior," J. A. Merrill, Ph.D., Pres. Emeritus, State Teachers College, Superior, Wisconsin.

"The Business Side of Medicine"—Dr. R. G. Leland, Chicago, Director of Bureau of Medical Economics, American Medical Association.

"The State Medical Association; A Going Concern," Dr. A. W. Adson, Rochester, President, Minnesota State Medical Association.

"President's Address," Dr. O. O. Larsen, Detroit Lakes.

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting, February 11, 1937.

Dr. Donald McCarthy, Presiding

CAUSE OF THE TOXEMIAS IN PREGNANCY

DR. R. T. LAVAKE

At the October 13, 1932, meeting of this Society, I discussed what seems to me to be the correct theory of the cause of the toxemias of pregnancy. This discussion appeared in the November 1st, 1932, issue of *THE JOURNAL-LANCET*. In summary, it may be stated as follows:

When the spermatozoön impregnates an ovum, an organism is evolved whose cells may or may not be toxic to the maternal organism. When toxic, the exotoxins and endotoxins of the developing cells of the products of conception are the causes of the toxemias of pregnancy. This is the only theory that accounts for every clinical manifestation.

After working on blood groupings, agglutinations, etc., etc., with no results, I wish to report what I believe to be an important finding in experimental substantiation of this theory. It suggested itself that if the fetal and placental cells might be toxic, that if I obtained placental serum, following delivery, by squeezing the placenta in a meat squeezer, such serum should or should not cause an intradermal reaction in the mother according as it were toxic or non-toxic.

This has been tried on eight normal cases showing no toxic signs or symptoms and one case of fulminating toxemia.

In the non-toxic cases, absolutely no reaction occurred around the intradermal bleb.

In the toxic case, a most angry reaction extended for $\frac{3}{4}$ of an inch around the bleb.

To my mind, if this reaction proves to be constant, this may be the last link in proof of the origin of late toxemia, and may help us in differentiating real pregnancy toxemia from toxemia based upon a nephritis.

Discussion

Dr. ELMER M. RUSTEN: Did you use that serum on other normal pregnancies?

Dr. R. T. LAVAKE: No, I have not used the placental serum of one patient on another.

Countless experiments suggest themselves to clear up the problem. If this theory is correct, the placental cells, if toxic, should be specific for that particular woman and women of her

cell make-up. To other women they might not be toxic. The experiments cited are an effort to give an ocular demonstration that sometimes the products of conception are definitely toxic to the mother herself and sometimes not; and when toxic, toxemia of pregnancy may result depending upon toxicity of the cells, the amount of infarction and necrosis of the placenta, and the eliminative capacity of the pregnant woman. The work is practical because, if correct, all measures that will tend to prevent placental infarction will minimize the causes of toxemia if the cells of the products of conception are toxic to the mother. If not toxic, no amount of infarction will precipitate a toxemia. The causes of placental infarction over which we may exercise control are the prevention of any infection in the mother such as abscessed teeth, sinuses, common colds, etc., and keeping metabolites low.

In very few cases of pre-eclamptic toxemia will you find absent the following links: some type of focal or general infection and some type of placental change manifested by localized gross color changes in the placenta, or by infarction.

Dr. R. C. WEBB: Have you tried this with other tissues than the placenta, the mother's serum, or serum from the child taken at the time?

Dr. R. T. LAVAKE: I have not tried it with the child's serum. I have worked out to my own satisfaction that there is no association as regards clumping between maternal and foetal blood. I have been more interested in the part that infection and consequent placental infarction may play because these elements lend themselves to prophylactic measures. I am quite sure from my experiments that no connection exists between the toxemias of pregnancy and agglutinative reaction between husband's, mother's and child's blood.

It would be interesting to see what the mother's serum would do to the child and to the mother herself. This approach immediately suggests innumerable possibilities of interest and practical value. I have brought this work before you merely to stimulate interest in this approach; and to report findings that suggest that this approach may furnish definite experimental proof that the causative toxin resides in the products of conception, and that the condition is not basically due to metabolic disturbance in the mother, such as hypoglycemia, etc.

A CLINICAL STUDY OF LOW BACK PAIN OF PROSTATIC ORIGIN FOLLOWING INJURY

Inaugural Thesis

ERNEST R. ANDERSON, M.D.

MINNEAPOLIS

The incidence of low back pain in the adult male has increased, especially, since the establishment of compensation acts. The employee will attribute the cause of his back trouble to some action or injury, whether it is slight or severe, occurring in his work. It is estimated that at the present time the occurrence of back pain is twice as frequent in the male as in the female. A few decades ago the medical profession was concerned with the ubiquitous female complaining of backache. It is to the credit of gynecology that pelvic diseases have been recognized as the cause of back pain and scores of women, relieved. Oliver Wendell Holmes' definition of a female as a "species of biped with a pain in the back" is no longer true.

Thirty-one years ago Young, Geraghty and Stevens³ in a comprehensive study of 358 cases of chronic prostatitis, found that pain in the back and over the sacrum were the only symptoms in 69 cases. Since that time the urologic literature contains several references of chronic prostatitis being the causative factor in producing back pain.

Low back pain following injury was recognized by Wesson⁵ as sometimes being due to a chronically-infected prostate gland and seminal vesicles. Webb⁴ in 1928 reported a series of such cases in which the disabling back pains disappeared when the chronic prostatitis and seminal vesiculitis were cleared up. In 153 cases of low back pain Duncan² found that chronic infection was present in the prostate gland in 83 cases and considered it as the etiologic factor. Chronic prostatitis prolonged the disability in a number of back injury cases which were studied and reported by Boies¹.

The importance of chronic prostatitis and seminal vesiculitis in back injuries will be readily appreciated when the prevalence of that condition is considered. It is the opinion of Wesson⁵ that practically all adult males have prostatitis. This may be questioned, however, as the urologists do not all agree. The teachers of histology and tissue microscopists find it hard to obtain sections of normal prostate gland and resort, consequently, to infant glands for material. Nielson⁵, an internist, reported a series of 200 patients having a variety of symptoms other than those associated with the genito-urinary system and found pus in the prostatic secretion in 85 cases. It would seem that 40 or 50 per cent of the adult males have evidence of an infection residing in the prostate gland.

The question arises then, "What is the source of the infection in the prostate gland?" For many years it was considered a complication of gonorrhea in practically all cases. Recent investigators have agreed that chronic inflammation of the prostate gland and seminal vesicles is produced by the gonococcus in about 40 per cent of the cases. The remaining cases are caused by septicemias or are the metastatic infections of other foci of infection in the body. In the order of frequency the chief bacteria that have been isolated from the chronically-infected prostate glands and seminal vesicles are as follows: staphylococcus albus, streptococcus pyogenes, colon bacillus and, occasionally, the gonococcus.

The pathology of the prostate gland when it is chronically infected, consists of an increased volume which is due to a fibrous hyperplasia. There is a periacinous round cell infiltration which is sometimes combined with a more extensive interstitial infiltration. Dilated orifices of acini are seen throughout the gland. Small cysts and small hemorrhagic lesions may also be present.

The prostate gland and seminal vesicles are richly supplied with nerves from the pelvic plexus which is connected with the hypogastric parasympathetic plexus. This plexus receives fibres from the tenth dorsal spinal segment to the third sacral. There are nerve endings of various kinds and ganglion cells scattered in the interstitial connective tissue of the gland. Head has shown that visceral stimuli will be referred to the surface of the body and interpreted as pain in the region which is supplied with the sensory cutaneous nerves from the same spinal segment from which the visceral nerves originate. The patient accepts this physical error of judgment and interprets the diffusion area of pain as the source of his pain. The pain originating from stimuli in the prostate gland and seminal vesicles would have a wide distribution because of connection with the tenth dorsal spinal segment to the third sacral. Young, Geraghty and Stevens³ in their analytic study found this to be true.

Besides having referred pains from the chronically infected prostate gland and seminal vesicles, the back pains can be produced by metastatic infection from this focus. A localized myositis, fibrositis or arthritis can be produced. These conditions will be improved by the eradication of the responsible focus.

This study is based upon 21 cases which have come under my observation in my association with Dr. R. C. Webb. These cases of low back pain have all occurred following injury. The injury in some cases has been very slight such as stepping off a trunk, a height of 2½ feet (case 9), or resulting from a jar received while riding on a tractor over a board track crossing (case 1). In others the injury was more severe—such as being knocked off a 15-foot scaffold and landing on the back (case 21). The severity of the injury did not determine the disability or the amount of back pain which the individual experienced.

The age groups at which these cases occurred are as follows: between 20 and 29 years 2, 30 and 39 years 11, 40 and 49 years 5, 50 and 59 years 3. The largest number of cases are in the fourth and fifth decades. This is what might be expected as the incidence of chronic prostatitis and seminal vesiculitis is high in these age groups.

Pain in the lower part of the back was the chief complaint offered by these patients. The pain varied in intensity from a

dull aching, characterized by some as being like a toothache, to a type that was more severe—sharp and knife-like. The pain was present in some patients continuously, having no relation to the position they assumed. In others the pain was relieved by lying down. One patient stated that he obtained relief when sitting in a chair if he allowed his weight to be taken by his arms resting on the chair arms (case 14). In all the cases the pain in the back was aggravated by bending forward. Walking made the pain worse in 15 of the cases; coughing increased the pain in 8 cases and it is interesting to note that 5 patients stated their pain felt as if it were "deep in."

The location of the pain varied considerably throughout the lower back. The pains were designated as occurring in regions from the lumbar back down to the buttock. Of the 21 cases pain occurred in the lumbar area in 3; in the lumbosacral area in 2; in the sacro-iliac area in 8; in the sacral area in 4; and in the buttock in 4. In 7 cases leg pains were associated with the back pains.

The onset of the back pains, in the majority of cases, dated from the time of the accident. This was true in 14 cases. The pain had its inception with the alleged injury, having no relation to whether the injury was severe or minimal as stooping over (case 19), or twisting of the body (case 4). In 7 cases the back pains were first noticed some time after the injury. This interval varied in duration from one-half hour to 14 months. In all the cases the individuals felt that the back pains were the result of the accident they had sustained.

On physical examination 8 cases presented some findings in the back. These findings consisted of tender areas located in different regions, namely over the sacro-spinalis muscles, over the spinous processes of the fourth and fifth lumbar vertebrae or only over the fifth and over the sacrum. In two of the cases there was a tilting of the back present when the individuals stood on their feet. Flexion of the back was limited in 4 cases because pain was produced. There was no muscle spasm of the back muscles found in any of the cases. Roentgenographic studies were normal in eleven of the cases.

The prostate gland was found to vary in size from about normal, or slightly larger, to a mass that nearly touched the sacrum. The size of the gland did not have any relation to the amount of disability that the individual experienced. One thing, frequently noted, was that in those individuals complaining of a unilateral back pain the corresponding lobe of the prostate gland or the corresponding seminal vesicle was enlarged. On examination of the prostate gland and seminal vesicles the tenderness present varied a great deal. This subjective symptom is hard to evaluate because the perception of pain differs in individuals. There was no consistent relationship found between the intensity of the back pains and that present in the prostate gland and seminal vesicles when they were examined. It is interesting to note that in a few cases the individuals volunteered that their back pain was worse while the prostate gland and seminal vesicles were being examined.

Unstained cover-glass preparations of the expressed secretion were examined. The presence of leucocytes was considered as pathologic. The number of leucocytes present varied and did not have any relationship to the size of the prostate gland and seminal vesicles, to the degree of tenderness in them or to the intensity of the back pains. In 15 cases leucocytes were found on the first examination, in 3 cases on the second examination. There was one case that no secretion appeared at the meatus on the first examination but on the second examination leucocyte-containing secretion was obtained. In 2 cases leucocytes were found on the third examination.

The back pains of these cases were relieved and disappeared when treatment was carried on for the chronic infection in the prostate gland and seminal vesicles. One individual had an immediate relief of the back pains following the first massage. Seven noticed improvement after the second massage. At the end of 4 weeks 19 were relieved of their back pains, one case at the end of 6 weeks and the remaining one at the end of 8 weeks.

There were 5 cases who lost no time from their work, 5 who lost 7 days or less and 11 who lost from 3 weeks to one year. Half of these cases, with low back pain, had a prolonged disability due to a condition which is usually considered less serious. When chronic prostatitis and seminal vesiculitis are not recognized as the causative factors in producing back pains, prolonged treatment and prolonged disability increase the expense to the compensation carriers in such cases. The employee also suffers because he is forced to endure a back pain which is a real thing to him. He has often been considered a malingerer or a neurotic when the chronic prostatitis and seminal vesiculitis were producing a definite and real pain.

Case Reports

CASE 1. G. M., aged 30, a mail handler, was injured July 2, 1933. While riding on a tractor over a board track crossing he was jarred. At the time he felt a pain on the right side in the lower part of the back. He continued to work.

He presented himself on July 3, 1933, stating that the pain in the lower part of the back on the right side was constant and more severe than it was on the day before. It was very difficult for him to get out of bed. Walking at first aggravated the pain but after he had been up awhile the pain did not increase. The pain was more noticeable on bending forward.

The past history was non-essential.

On examination of the back it was found to be normal. The prostate gland was enlarged, smooth and very tender. The right seminal vesicle was enlarged. The smear of the secretion contained five to ten leucocytes per low power field.

After the first massage he stated that the back felt much better. He continued doing light work. At the end of two weeks he was free from back pains.

CASE 2. A. A., aged 53, a stower, was injured September 14, 1936, at 10:00 A. M. He was moving a boiler with a bar. The bar slipped causing him to bend forward suddenly. On straightening up he felt a pain in the small part of the back. The pain continued and became worse after sitting down to eat his lunch.

He presented himself four hours after the accident complaining of a constant pain across the small of the back. The pain was aggravated upon his bending forward. Walking did not increase the pain nor did the pain radiate.

The past history was non-essential.

Upon examination the back was found to be normal except for a slight limitation of flexion caused by pain. There was no muscle spasm or rigidity in the back muscles. The prostate gland was enlarged, soft and tender. The first smear was normal; the second smear of the prostatic secretion contained leucocytes.

After the second massage he was free from back pains and so remained. This man continued to work and did not lose any time from work.

CASE 3. O. C., aged 37, a switchman, was injured February 7, 1930. He was caught between a moving boxcar and a platform and was rolled one complete turn. He was examined shortly after the accident and was found to have some abrasions over the lower back. Roentgenographic studies of the lumbar spine and sacroiliac articulations were normal. He returned to work in ten days.

He presented himself on December 14, 1931 complaining of pain in the middle of the lower part of the back. The pain had been present for three weeks. The pain was dull in character and came on after he had worked for three or four hours. On occasions he had sharp pains when he straightened up after he had stooped over. When he arched his back and bent backwards he had a sensation of something slipping in the back. On placing his weight on the right leg the pain in the back was aggravated.

The past history was non-essential.

Upon examination the back was found to be normal. The prostate gland was enlarged, soft and tender. The right lobe of the gland was distinctly more swollen. The smear of the secretion contained fifty to seventy leucocytes per high power field, occurring in groups.

The prostate gland was treated. He did not lose any time

from his work. At the end of four weeks he was free from back pains.

CASE 4. F. H., aged 33, an airbrake rackman, was injured January 4, 1934. His body was twisted when a gasoline engine which he was cranking "kicked back." He had pain in the left side of the lower part of the back immediately and the back felt stiff.

He presented himself on January 6, 1934 complaining of having a constant pain in the left side of the lower part of the back. The pain was made worse by walking. He obtained relief by lying down.

The past history was non-essential.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There was a tender area over the sacrum and over the lower third of the left sacro-spinalis muscle. The prostate gland was of normal size, smooth, firm and slightly tender. The first and second examinations of the smear of the secretion were normal. On examination of the third expressed secretion fifteen to twenty leucocytes per low power field were found.

After treatment of the prostatitis for two weeks the back was less painful. At the end of six weeks the back pains were gone. He did not lose any time from his work.

CASE 5. H. G. O., aged 34, a telegraph operator, was injured in December 1932. While pulling a loaded four-wheel truck, his feet slipped causing him to fall backwards landing on his buttocks. He continued to work. He continued to have slight pain in the lower part of the back on the left side. In January 1934 the pain became more severe, especially when he sat down.

He presented himself May 27, 1935 complaining of having a constant ache in the lower part of the back on the left side and in the left buttock. The pain had been more severe for the last two months. The pain was aggravated by sitting on a soft cushion or soft seated chair.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. The prostate gland was enlarged, smooth and tender. The left lobe was boggy. The smear of the secretion contained twenty-five to thirty-five leucocytes per low power field. The coccyx was normal.

He was referred to his local physician who carried on treatment for his chronic prostatitis. Reports were received that he was free from back pains at the end of three weeks. He did not lose any time from his work.

CASE 6. H. M., aged 47, a brakeman, was injured December 26, 1936 at nine A. M. In stepping over a rail the left foot slipped and he fell backwards. He got up and continued to work. Immediately he had a pain in the lower part of the back. The pain became more severe and he quit work at eleven thirty A. M. He went to a physician who advised him to rest. He returned to work December thirtieth.

He presented himself on December 31, 1936 complaining of having pain in the lower part of the back. The pains did not radiate. He had cold and warm sensations which went up the back. In the back of the left thigh he had soreness and he stated that the thigh felt weak.

The past history was non-essential. He had not had any venereal disease.

Upon examination the back was found to be normal. There was no spasm or rigidity of the back muscles. No tender areas were found. The extremities were normal. The prostate gland was smooth. The left lobe was enlarged and tender. The smear of the secretion contained eight to ten leucocytes per high power field.

He was referred to his physician to carry on treatment for the chronic prostatitis. In two weeks the back pains were gone. He continued to work from December 30, 1936.

CASE 7. A. D., aged 26, a mail handler, was injured June 15, 1931. He jumped off a truck, a distance of five feet, landing on his feet in a stooped position. He got severe pain in the small of the back and could not straighten up.

He presented himself a few hours after the accident complaining of having a constant sharp pain in the middle of the lower part of the back. The pain was aggravated by bending forward.

The past history was non-essential.

On examination the back was found to be normal except for an area of tenderness over the fifth lumbar vertebral spine. There was no muscle spasm or rigidity of the back muscles. The prostate gland was enlarged, soft and tender. The smear of the secretion contained ten to fifteen leucocytes per low power field.

After the first treatment the back felt better. He returned to work June nineteenth and did not have any pain after that.

CASE 8. M. B. H., aged 42, a carpenter, was injured June 14, 1928. He was struck on the head by a pile driver weighing eighty pounds which fell a distance of twelve feet. The scalp was lacerated, he was not unconscious. He was off work for four and a half days. He worked steadily up to January 1932 when he was off for ten days because of pain in the lower part of the back.

He presented himself on November 9, 1932 complaining of having a steady stabbing pain in the left side of the lower part of the back. The pain had been present for the last eleven months. The pain did not radiate. It was aggravated by bending forward and by lifting. He was relieved of the pain by lying down.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to be normal. The pain was located over the left sacroiliac region. There were no tender areas. The prostate gland was of normal size, smooth and firm. The smear of the secretion was normal. On the second examination the prostate gland was slightly enlarged, smooth and tender. The smear of the secretion contained five to eight leucocytes per low power field.

The roentgenograms of the lumbar spine and sacro-iliac articulations were normal.

The back pains were relieved after the second massage. He was referred to his physician for continued treatment. He returned five months later complaining of pain, of twelve days duration, in the left side of the lower back. He had not followed up the treatment for the chronic prostatitis. Examination at that time revealed an enlarged, tender prostate gland. The smear of the secretion contained leucocytes. After treatment of the chronic prostatitis he was relieved of the back pains.

CASE 9. P. T., aged 34, an electrician, was injured September 22, 1923. He stepped off a trunk two and a half feet high and felt a snap in the back. He could not straighten up and was off work for seven days.

He presented himself on January 25, 1933 complaining of having a soreness which had been present since the accident in the small of the back. When he worked in a stooping position he would get a catch and pulling sensation in the back. The back had been more sore for the last three weeks.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There was a tender area over the right sacro-iliac region. The prostate gland was enlarged, smooth and tender. The right lobe was very tender. The smear of the secretion contained ten to fifteen leucocytes per low power field.

The roentgenograms of the lumbar spine and the sacro-iliac articulations were normal.

After treatment for ten days the back felt better. At the end of three weeks the back pains were relieved. He did not lose any time from his work.

CASE 10. J. M., aged 37, a car cooper, was injured April 12, 1931 at ten A. M. He jumped from the door of a standing box car landing on both feet. At the time he had a sharp pain in the left side of the small of the back. The back became stiff and he had to quit work at noon because of the pain and stiffness in his back. The following day he stayed in bed all day.

He presented himself on April 14, 1930 complaining of pain in the left side of the small of the back and stiffness of the back.

On examination flexion and extension of the back were found to be slightly limited. There was a tender area over the left sacro-iliac region. The prostate gland was swollen, smooth and tender. The smear of the secretion contained forty to fifty leucocytes per low power field.

The back was greatly improved after the first massage. He returned to work April eighteenth and remained free from pain in the back after that time.

CASE 11. O. E., aged 53, a stockman and farmer, was injured February 8, 1931. As he was going to sit down he was thrown against the arm rest of a train coach seat, striking the right side of the lower back. He had pain in the right side of the lower back. He had seen seven physicians at different times on account of his pain. The back had been taped, heat and massage treatments had been given and he had been supplied with a belt.

He presented himself on March 31, 1931 complaining of having a constant dull gnawing pain in the lower part of the back on the right side. The pain awakened him at night. Walking and bending forward made the pain worse. The pain did not radiate.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. Flexion of the spine was limited slightly because of producing pain. There was a tender area over the right sacroiliac region and over the fourth and fifth lumbar vertebral spines. The prostate gland was markedly enlarged and very tender. The smear of the secretion contained sixty to eighty leucocytes per low power field.

The roentgenograms of the lumbar spine and sacro-iliac articulations were normal.

After the fourth massage the back began to feel better. At the end of four weeks the back was much improved.

CASE 12. A. F. H., aged 43, a yardmaster, was injured August 1 and 29, 1931. On August first he felt a twinge on the right side of the lower part of the back when he was pushing a box car. The back remained sore but he continued to work. On August twenty-ninth when pulling on a switch handle the back became more painful. The pain gradually became more severe. At times he had sharp knife-like pains in the back. At intervals he had pain down the back of the right thigh. On September sixteenth the pain became very severe and he had to quit work. He was carried to his automobile. He took mud baths for three days.

He presented himself on September 19, 1931 complaining of sharp pain on the right side of the lower back. The pain was aggravated by walking and by bending forward. He had to walk with the aid of crutches.

The past history was non-essential.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. The prostate gland was firm, smooth and tender. There was no secretion obtained on the first massage. The smear of the second massage was normal. The smear of the secretion following the third massage contained thirty-five to fifty leucocytes per low power field.

The back felt better after the second massage. He returned to work October eighteenth. The back was free from pain.

CASE 13. R. B., aged 32, a laborer, was injured August 14, 1933. The bar, which he was using to move a box car, slipped and he fell to the ground, twisting his body to the right. Immediately he felt a burning sensation in the left side of the lower back. He continued to work. Two days after the accident he went to a physician who supplied him with a canvas belt.

He presented himself on August 21, 1933 complaining of having pain in the lower part of the back on the left side. The pain went down the back of the left thigh. The back pains

were aggravated by coughing. He was unable to get out of bed because of the pain.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There was a tender area over the sacrum. The prostate gland was flat, soft and tender. The smear of the secretion contained three to five leucocytes per high power field.

The roentgenograms of the lumbar spine and sacro-iliac articulations were normal.

After the second massage the back was much improved. He returned to work at the end of three weeks, free from back pains.

CASE 14. L. B., aged 35, a coal shed laborer, was injured May 28, 1936. About one-half hour after wheeling a wheelbarrow full of coal he began to have a pain in the center of the lower part of the back. He continued to work. The pain became worse through the day.

He presented himself on May 29, 1936 complaining of a dull aching in the left side of the lower back which was so severe that he could not get out of bed. On standing the pain was felt down the back of both thighs. The pain was aggravated by coughing. In sitting in a chair he was most comfortable when he supported his weight on the chair arms with his arms.

The past history was non-essential.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. Flexion of the spine was limited about fifty per cent because of producing pain. The prostate gland was of normal size, soft and tender. The smear of the secretion contained five to eight leucocytes per high power field.

The roentgenograms of the lumbar spine and the sacroiliac articulations were normal.

The back pains were relieved by treatment of the chronic prostatitis. He returned to work at the end of three weeks free from pain.

CASE 15. R. V. B., aged 46, a brakeman, was injured the first time September 4, 1931. He was thrown from the top of a box car, landing on his buttocks. The back was X-rayed and he returned to work in six weeks. After the accident he had a dull aching in the lower part of the back. In September 1932 he had an attack of sharp pain in the lower part of the back when he was lifting some freight. He was off work for five days. On October 29, 1932, with the help of another brakeman, he bent over to lift a plow beam. When he straightened up he had a sharp pain in the lower part of the back. He had to quit working.

He presented himself November 7, 1932 complaining of a constant sharp pain in the lower part of the back when he got up. The pain was relieved by lying down. The pain was aggravated by walking and by bending forward. He had pains down the back of the left thigh.

The past history was non-essential. He had had gonorrhea twenty years ago.

On examination the back was found to list to the right. Flexion of the spine was limited fifty per cent because of producing pain. There was no muscle spasm or rigidity of the back muscles when he laid on his abdomen. There was a tenderness over the lumbo-sacral and sacral regions. The prostate gland was enlarged and tender, especially over the left lobe. The smear of the secretion contained thirty to forty leucocytes per low power field.

The roentgenograms of the lumbar spine and the sacro-iliac articulations were normal.

After he had received two prostatic massages he volunteered that his back felt much better. He was referred to his physician for further treatment. In three weeks he returned to work.

CASE 16. J. N., aged 38, a steamfitter, was injured July 5, 1932. He fell from the top of a coach striking his left buttock on his partner's knee. He fell a distance of five or six feet. He had pain in the left side of the lower part of the back immediately. He continued to work. The pain gradually became worse and he went to a physician on September

19, 1932. On examination the back was found to be normal. There were tender areas over the fifth lumbar vertebral spine and over the left sacro-iliac regions. Roentgenographic studies of the lumbar spine and sacro-iliac articulations were normal. This man was treated with heat and massage treatments to his back. A low back brace was applied. Five injections of streptococcus vaccine were given. He had had hospitalization for eleven days in November and leg traction had been applied.

He presented himself on November 21, 1932 complaining of a constant pain in the left side of the lower part of the back. The pain was present day and night and was aggravated by standing. He had a catch in the lower part of the back when he bent forward and when he straightened up he had sharp pains.

The past history was non-essential.

On examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. The prostate gland was swollen, boggy and tender. The smear of the secretion contained ten to fifteen leucocytes per low power field.

This man returned to his physician, treatment was carried on for chronic prostatitis. He was free from back pains and returned to work four weeks later.

CASE 17. C. M., aged 48, a switch foreman, was injured March 28, 1934, by being caught between a moving box car and a platform. He sustained a compound fracture of the internal condyle of the left femur involving the knee joint and a fracture of the right fibula.

Three months after the accident he began to have soreness and stiffness in the lower part of the back when he stooped over. It was hard for him to straighten the back. The lower part of the back became sore when he sat and drove his car. The soreness in the back gradually became worse so that he had constant aching. The aching was relieved by lying down. The pain did not radiate.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to be of normal contour. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. The prostate gland was flat, soft and tender. No secretion was obtained at the urethral meatus on the first examination. On the second examination the smear contained one hundred to one hundred twenty leucocytes per high power field.

After receiving treatment for six weeks the patient stated, "My back does not feel stiff and I have no soreness." He returned to work September 21, 1934.

CASE 18. G. M., aged 50, a section foreman, was injured June 14, 1935. He fell backwards, eight feet, off a ladder. He landed on the ground on his back. He had pain across the lower part of the back immediately. He was taken to a physician. The back was X-rayed and adhesive tape was applied. He received heat treatments to the back.

He presented himself on July 20, 1935 complaining of having a pain in the center and the right side of the lower part of the back. The pain was relieved by lying down. Walking and bending forward aggravated the pain.

The past history was non-essential.

On examination the back was found to be of normal contour. There was no muscle spasm or rigidity of the back muscles. There were no tender areas. He localized the pain in the region of the fifth lumbar vertebra. The prostate gland was enlarged, firm and tender. The smear of the secretion contained twenty to thirty leucocytes per low power field.

The roentgenograms of the lumbar spine and sacro-iliac articulations were normal.

After the second prostatic massage the back was better. He was referred to his physician for the continuation of the treatment. He returned to work at the end of two weeks, free from back pains.

CASE 19. A. K., aged 25, laborer at the time of injury, was injured June 25, 1934. He was helping lift a slab of marble when he felt a snap in the middle of the lower part of the back. He continued to work. That evening, after sitting still,

his back became stiff. When he straightened up he felt a pain in the back. He continued to work for one week at which time the job was finished. The day following the injury he went to a physician who taped his back and applied heat treatments for seven weeks.

Because the pain continued, he went to an osteopath who first had his back X-rayed by a competent roentgenologist. It was found to be normal. He received treatments to his back during July and August without obtaining relief.

In the last part of August he returned to the original physician and received heat treatments regularly up to October. A canvas belt was applied to his back in September. He began teaching school in September but could not perform his duties as an assistant athletic coach because of the back pains.

He presented himself on December 28, 1934 complaining of pain across the lower part of the back and in both buttocks. The pain was felt at times down the back of both thighs. It was aggravated by walking, especially on irregular surfaces. The pain was worse when lying in bed and he was unable to roll from one side to the other because of the pain in the lower back and buttocks. There was no pain present when he stood or sat still. He was unable to play golf, volley ball or referee basketball games because of the pain in the lower part of the back and buttocks.

The past history was non-essential. He had never had any venereal disease.

Upon examination the back was found to be normal. There was no muscle spasm or rigidity of the back muscles. The prostate gland was enlarged, soft and tender. The smear of the secretion showed fifty to sixty leucocytes per high power field.

After the second treatment his back felt better. In three weeks he stated that his back was cured and that he had played seven games of volley ball and refereed an overtime basketball game.

CASE 20. W. B., aged 39, a railway conductor, was injured in February 1931. He fell five or six feet from the side of a box car landing first on his feet and then falling to the ground. The left knee was injured. He returned to work two days later and in three weeks the knee was well. About six weeks after the accident he began to have soreness and lameness in the lower part of the back on the left side. He continued to work. The pain remained in his back and gradually became more severe. On April 15, 1932 he had to quit working because of the pain, and consulted a physician. He continued to be disabled and during the first part of June went to an orthopedic surgeon near his home town. The back and pelvis were taped and later he was supplied with two different orthopedic belts without obtaining relief. At the end of four weeks a sacro-iliac fusion operation was advised.

He presented himself on June 24, 1932 complaining of a constant pain in the lower part of the back on the left side. The pain felt like as if it were "deep in." He also complained of pain in the back of the left thigh. Walking aggravated the pain to such an extent that he could only walk a distance of two blocks before he had to stop. He was most comfortable sitting down and at night got up and sat in a chair to get relief from the pain.

The past history was non-essential. He had not had any venereal disease.

On examination the back was found to tilt to the left when the patient stood. When lying down there was no muscle spasm or rigidity of the back muscles. There was a tender area over the left sacro-iliac region and around the left posterior iliac spine. Motions of the back when he stood were limited because of producing pain. The back motions were free when he sat on a stool. The prostate gland was diffusely enlarged, tender and felt boggy. The first two examinations of the secretion did not contain leucocytes. On the third examination the smear of the prostatic secretion contained fifteen to twenty leucocytes per high power field.

The roentgenograms of the lumbar spine and the sacro-iliac articulations were normal.

This man returned home and his physician carried out the treatment for the chronic prostatitis. He returned in eight weeks for observation and at that time he was free from back pains and was planning to return to work.

CASE 21. L. S., aged 30, laborer, was injured January 20, 1931. He was knocked off a fifteen foot scaffold striking his back and head on the frozen ground. He was unconscious and was taken to the hospital in an ambulance. On regaining consciousness he had headaches and pain in the small of the back. The head and back were X-rayed and found to be normal. At the end of twenty-four days he left the hospital wearing a wide canvas belt.

Four weeks after the accident he was examined by a consulting physician who reported the spinal column normal, no muscle spasm or rigidity in the back and the motions of the back normal. A rectal examination was not made. A diagnosis of functional neurosis was made and it was estimated that he would be back to work in three months.

This man was examined in July 1931 by the third physician who reported that the physical examination, including a rectal, was normal. The pain in the back was considered the result of the contusion to the back.

On September 4, 1931 he first presented himself. His complaints were: first, a constant aching in the lower part of the back and in the back of the left hip, the pain being sharp when a quick step was made or when stepping on an irregular surface; second, he was unable to walk without crutches because of the pain; third, he had headaches; fourth, he had an aggravation in his diabetic condition, necessitating him to take more insulin.

Past History: The diabetes mellitus had been present for four years. He had gonorrhea when fifteen years of age.

Upon examination the back was found to be normal except for tenderness over the left sacro-iliac articulation and medial to the left greater trochanter. The prostate gland was enlarged, smooth and tender. The left seminal vesicle was enlarged and tender. The smear of the secretion contained five to ten leucocytes per high power field. The blood Wassermann was positive. The urine gave a positive reaction for sugar.

This man was hospitalized and Dr. Donald McCarthy was called as consultant. The diabetes was studied and controlled. The chronic prostatitis and seminal vesiculitis were treated by massage and hot Sitz baths. He developed acute thyroiditis which subsided with the use of hot packs and the discontinuation of the prostatic massage. He left the hospital October 3, 1931 walking on crutches with the back and hip pains unchanged. The prostate gland became markedly enlarged, nearly touching the sacrum. It was very tender and the secretion was loaded with leucocytes.

On October 13, 1931 the prostate gland was drained by Dr. R. C. Webb through a perineal incision. The tissue of the gland was edematous and no abscess cavity was found. As soon as the soreness from the operation subsided he was free from back and hip pains. He left the hospital on October 31 walking without crutches and without pain. The prostate gland has been examined on several occasions since and found to be of normal size, firm and not tender. The smears of the secretion contained no leucocytes. Anti-luetic treatment was begun at Ancker Hospital the last part of November 1931. He returned to work January 15, 1932.

In some cases chronic prostatitis and seminal vesiculitis will cause referred pains in the lower back thereby producing a clinical picture that may be confused with conditions brought on by injury. The prostate gland and seminal vesicles should be examined in all cases of low back pain. Where they are suspected of being the cause of the pain it may be necessary to make repeated examinations to determine the presence of the infection.

Disability will be reduced if the chronic prostatitis and seminal vesiculitis are recognized and eradicated at the onset.

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Discussion

Dr. H. B. DORNBLASER: I have had only one case of prostatitis in my gynecological practice and that cleared up very nicely with Elliott treatments. A rubber prostatic applicator was introduced into the rectum with a great deal of pain to the patient the first few times it was used. It was surprising, however, how quickly the prostatitis cleared up.

Dr. M. O. HENRY: I think the paper is most interesting, and it reminds me of what we were taught in school days about syphilis. We were taught that syphilis may simulate almost any condition in medicine and surgery. This seems to be true of back pain—almost anything may produce it. I suppose that every adult male has had a prostatic back-ache at some time or another, but I do not think it is attended by muscle spasm. Prostatic disease may cause back-ache, but it is unlike the acute traumatic back pain and is not attended by muscle spasm.

Dr. J. M. HAYES: I was with the Mayo Clinic when Von Lackum first called attention to the fact that many of these pains were due to prostatic infection. He was about the most enthusiastic adherent to this theory I have seen. Dr. Herbst, who trained in that department and later came to Minneapolis, was also a very ardent supporter of this belief. In many of these indefinite back pains, I am sure he did get some good results by massaging the prostate. The great difficulty is to determine which patients should be subjected to this treatment. I have seen several patients receiving this treatment over long periods of time in whom I could see no definite indication for the treatment, neither did I see any improvement in the condition of the patients. No doubt, it requires good judgment and a proper knowledge of the technique to get the desired results. These cases of Dr. Anderson's are interesting. After all, the clinical result is what counts.

Dr. C. J. EHRENBERG: I would like to ask if there is any relationship between this type of infection and allergy. Can allergy cause back pain and if so, just what is the mechanism of the thing? From the standpoint of infection in gynecology one must recognize that infection does give rise to low back pain. There are too many women in whom a cervicitis is cleared up and the back pain relieved, to discount it. But what is the mechanism of that infection causing the back pain, if that can be answered.

Dr. DONALD MCCARTHY: Do you think you are justified in calling or diagnosing a case of chronic prostatitis purely on the presence of 5-10 leukocytes per HPF in the third attempt? Do you think this necessarily means that this patient has a chronic prostatitis? I grant you that where the patient has a lot of pus cells that is another matter; but if you were to take a fair number of prostates and massage them a few times don't you think you would get a few leukocytes in a rather high percentage of them?

Dr. C. D. CREEVY: There are three things I would like to say about prostatitis. 1. Usually the infected prostate feels perfectly normal on rectal examination. 2. One can hardly talk about curing prostatitis. I will wager that if you got those patients back you would find pus in the prostatic secretion of all of them. Relief is usually due to improvement in drainage because the prostate was not designed to be cured of an infection. 3. I do not think you designate any fixed number of pus cells per H. P. F. as constituting prostatitis. I think the best test is whether the patient gets relief from treatment.

Dr. C. J. EHRENBERG: How can you say there is no muscle spasm simply because you do not feel it? These men admit that when they walk along they can only walk two blocks before they have to stop, or they cannot walk on uneven ground. Is that muscle spasm? Many of these people say they get up in

the morning and cannot stoop over, but as they go along through the day they find a little more freedom in bending. Is that muscle spasm? Personally, I think it is muscle spasm in the deep vertebral muscles, and not reflex visceral pain manifested peripherally. Nobody, as far as I know, has ever explained satisfactorily the mechanism of this low back pain—even though chronic infection is the cause.

Dr. E. T. EVANS: How can a man have a tilt which is an assumption of a position for protection unless he assumes that position voluntarily as a malingerer or unless he assumes it because there is a stimulation requiring him to assume that position for protection, and when he assumes that position for true protection there is a muscle spasm. When you lay a man down he may relieve himself. The absence of spasm on a particular test does not mean he does not have that spasm on another test. I have never seen a patient with a scoliotic tilt who did not have a muscle spasm for a basis unless he was assuming that position as a voluntary malingerer.

Dr. E. R. ANDERSON: This discussion dealt only with cases of back pain, following injury, which unquestionably was caused by chronic prostatitis. As brought by the discussers there are other conditions which cause back pain. In selecting the cases for the basis of this paper, those that revealed any abnormal conditions of the spine or sacro-iliac articulations by X-ray study were excluded. The chronic prostatitis may be the focus of infection from which a metastatic infection can originate and cause arthritis in the spine.

Involuntary muscle spasm was not present in any of the cases selected for the basis of this study. In some of the cases there was an apparent muscle spasm present when the patient was examined in a standing position. When the patient was placed on the abdomen and the back examined, no muscle spasm was found. Muscle spasm is not produced by chronic prostatitis.

The pain that is present is a referred pain. The stimulus is set up in the infected prostate gland and pain is interpreted by the patient in the area of distribution of the peripheral nerve that originates from the same spinal segment as the visceral nerve.

The prostate gland to be normal should not contain any leukocytes in the secretion. The degree of infection can not be determined by the number of leukocytes present.

The diagnosis of chronic prostatitis is based upon the findings of palpation and on the microscopic examination of the secretion. In some cases of chronic infection leukocytes will not be found on a single examination. It may be necessary to make repeated examination of the secretion. The number of leukocytes in a smear vary greatly. One examination may show a large number and the next one may contain only a few. There is no relationship between the number of leukocytes present and the size of the prostate gland or the amount of tenderness present. The gland can be very large and the secretion contain just a few cells or the gland may feel normal and the secretion contain a large number of leukocytes.

The chronic prostatitis usually does not stay cured. Treatment to the gland improves it and the patient gets relief from his symptoms. When relieved of the back pains which had been attributed to the accident but which were actually due to the chronically infected prostate gland the disability ceases.

THE STATUS OF TRANSURETHRAL RESECTION OF THE PROSTATE

Inaugural Thesis

Dr. C. D. CREEVY

In the past ten years the treatment of obstructive lesions at the vesical neck has undergone a substantial change which has been accompanied by a good deal of acrimonious debate. The extent of this change may be judged by the titles under "Prostate Gland" in the Quarterly Cumulative Index. In 1927 there were five references to transurethral operations and fifty-three to prostatectomy. In the last half of 1935 and the first half of 1936 there were eighty-five relating to transurethral procedures and fifteen to prostatectomy.

The references in the 1927 volume all came from the United States, where the modern operation of transurethral resection originated, while those of the past year came from nearly every civilized country in the world. The rapidity and extent of the spread of interest in this subject are valuable indices of the need for improvement in the surgical treatment of the obstructing prostate.

It is interesting to speculate as to the cause of the change from prostatectomy to resection, particularly when one recalls the smug references to the virtues of prostatectomy which were current when the transurethral operation appeared.

One reason for the widespread interest in closed operations upon the prostate is to be found in the recent substantial increase in longevity, so that far more men live into the prostatic age than was formerly the case. In the time of Shakespeare, few reached the age of prostatism; today most men face this possibility. Moreover, the fact that most physicians expect to and do reach this age has certainly contributed to the rapid development and spread of the method.

Additional factors are readily found. The average patient who undergoes prostatectomy must expect to face the following possibilities: (1) A hospital stay of 7 to 14 or more days in preparation for operation. (2) A mortality rate ranging from 2.3 per cent¹ in the hands of a very few experts to 25 per cent² in the hands of less experienced surgeons, and averaging at least 6 per cent in good hands under average conditions³. (3) A period following operation during which he will be wet, emit unpleasant odors, and possess uncertain control over the escape of urine. (4) A postoperative stay in the hospital averaging thirty days⁴.

Such a patient could, if he were a physician, balance the greater risk of death and the very slight risk of incontinence after the supra-pubic operation against the lower mortality and greater risk of incontinence after the perineal method. He might be influenced by the possibility that there are, among those surviving the perineal operation many whose uncertain or absent control of micturition is a source of very severe discomfort and embarrassment to them.

Anyone weighing these facts and contemplating the possibility of developing prostatism himself was certain to search for safer, pleasanter methods. The search began early in the modern surgical era and suffered many vicissitudes before attaining any measure of success. The attempts of Guthrie (1834), of Mercier, and of Bottini (1874) failed because their instruments were blind and because the danger of operating upon the prostate in the presence of impaired renal function was not recognized. Before the beginning of the current century both Wossidlo and Wishard had developed cystoscopic cauteries that might well have become widely used, had not Freyer at this time demonstrated the ease and effectiveness of suprapubic prostatectomy which then had a lower mortality than the unperfected transurethral procedures.

The modern operations date from the prostatic punch of Hugh Young in 1911. This was the first instrument to permit the actual removal of tissue under direct vision. It was devised by Young and used by him only for the fibrous, contracted prostate which could not be enucleated; the operation might have remained thus limited in scope had not Caulk⁶, in 1920, begun attacking the hypertrophied gland with a similar instrument. To him goes the credit for awakening interest in the possibilities of the method.

Once he had broken down the resistance of the profession, which took almost ten years, development was rapid. The work of T. M. Davis⁷ gave a great impetus to the wide application of these methods, as did the reports of Bumpus⁸, Alcock⁹, and Thompson¹⁰, all of whom reported large series of cases with, in many instances, almost incredibly low mortality (0.9 to 2.5%).

At the present time the instruments used in this country are fairly well standardized in two forms, the punch and the resectoscope. The former employs either a knife (Braasch-Bumpus, Thompson) or a cautery (Caulk) and all resemble in principle the original instrument of Young. The latter are derived from the instrument of Stern, the modification of Mc-

Carthy being more generally used than all other instruments combined. These instruments excise tissue with a wire loop charged with high frequency (diathermy) current.

With either instrument, the object is the removal of a sufficient number of small pieces of prostatic tissue to convert the prostatic urethra into a funnel shaped opening which is free from encroachments either in its lumen or at its junction with the bladder. The original notion of some early writers that one could cut a channel through a large gland by removing a few bits of tissue is wholly incorrect because the hypertrophied gland is flexible and movable. If a few pieces are removed, the remaining mass moves over and continues to occlude the urethra; it is quite possible to convert a partial retention of urine into a complete one by removing a small median lobe and allowing the lateral lobes to move together.

In any case, bleeding is controlled by electro-coagulation of individual bleeding points, and postoperative drainage is provided by a large inlying catheter.

The general application of these methods has met with bitter resistance, particularly from the older urologists, and the literature is filled with unsound statements both condemning and praising transurethral operations. For example, one of its early proponents did serious harm by stating that he performed the operation in his office under caudal anesthesia and had the patient walk to the hospital. While he did this successfully, any attempt by inexperienced operators to emulate this rash plan must have caused serious mishaps and have thrown the method into disrepute in many quarters.

At the other extreme is the prominent urologist who said in 1933, "This is as serious an operation as exists in surgery." The absurdity of making such a statement about an operation which has a mortality as low as one to two per cent in expert hands is too manifest to require comment. His statement that resection bottles up infection by sealing the prostatic ducts is also incorrect, as one may readily obtain prostatic secretion by massaging the gland which has healed after a resection.

The chief differences of opinion in discussions of transurethral resection have involved:

- (1) The true mortality of the operation;
- (2) The indications for its use;
- (3) The incidence of postoperative hemorrhage;
- (4) The risk of incontinence;
- (5) The danger of "missing a cancer which might have been cured by prostatectomy"; and
- (6) The danger of early recurrence of obstruction to urination.

The arguments on behalf of the operation are easily summarized. They are:

- (1) The mortality in general is much below that of prostatectomy;
- (2) It may be used by the experienced operator for all but the largest glands; which means more than 90% of all obstructing prostates, irrespective of their configuration;
- (3) The incidence of postoperative hemorrhage is very low in experienced hands. (The proponents of prostatectomy have entirely forgotten that it is also followed at times by secondary hemorrhage);
- (4) The risk of incontinence in experienced hands is slight;
- (5) The possibility of curing cancer of the prostate by any method now available is extremely small, but opponents of resection have raised the objection that with it, early cancers which might be cured by prostatectomy will be overlooked.

That this objection is not a serious one is shown by the report of Bumpus¹¹, who found that only 7.3 per cent of carcinomas, most of them early, were cured by prostatectomy. Young¹² had 60% of five year survivals in operable cases after radical perineal prostatectomy, but only 24 of 258 cases were operable; 8 of these lived five years, a percentage of cure in the whole series of 3.1%.

Thus, an opportunity to cure cancer will be missed in but 3% of carcinomas; since carcinoma accounts for not more than 20% of obstructions at the vesical neck, the use of transurethral resection instead of any form of prostatectomy in all

cases of obstruction will result in missing a theoretical opportunity for cure in 0.6% of the cases.

The substantially lower mortality of the resection compensates many times over for the above-cited theoretical advantage of prostatectomy. Moreover, Hunt¹³ has pointed out that prostatectomy for benign hypertrophy does not guarantee against the subsequent development of carcinoma in the posterior lobe which remains as a part of the surgical capsule.

- (6) Recurrence has not yet proved a serious problem, and
- (7) The period of hospitalization, both preoperative and postoperative, is much shortened (14 days in my experience), and the wet period is eliminated. This is an economic advantage to the patient, and effects a considerable saving to the hospital in linens, dressings, and nursing care.

Nevertheless, there are two disadvantages inherent in transurethral resection. The first of these is the difficulty of mastering the technique of operation. No conscientious surgeon will attempt it until he has first become an expert cystoscopist, and then had competent instruction in the technical aspects of the operation. Alcock has suggested that no one may attain reasonable proficiency until he has performed fifty resections, but my own opinion is that a hundred is more nearly correct. There are very few places in this country where one may attain such an experience, and these are closed except to those few who are bent on securing general training in urology. Therefore, relatively few men may attain proficiency in the method, but to use this as an objection to the operation is like condemning all surgery of the brain because relatively few surgeons are able to secure the requisite training. Transurethral resection will always remain an operation for specialists.

The one genuine objection to the method is the possibility of early recurrence of the obstruction. It is manifestly impossible to remove all of the abnormal prostatic tissue in a given case by transurethral resection, since one cannot tell at operation when normal tissue has been reached. It is therefore necessary to remove only that portion which is causing the obstruction. While Caulk claims that the remaining abnormal tissue will atrophy if the obstruction has been completely relieved, this is open to doubt, and the fact is that there is a very definite possibility that recurrence will be relatively frequent after resection for benign hypertrophy.

Several factors mitigate the seriousness of this possibility. First, the average age of the patient coming to operation at my hands has been 66 years in 561 cases, so that his normal life expectancy is but a few years.

Second, the duration of symptoms before operation averages about five years; it is well known that symptoms do not appear until the hypertrophy has become large enough to produce obstruction, probably a matter of several years after the actual onset of the disease.

It is thus apparent that, if an adequate amount of tissue is removed, the chances of recurrent obstruction are small. The determination of what constitutes an adequate amount of tissue in a given case must be determined by the individual surgeon. In my own cases, it has averaged 26.6 grams in the past year, although it was but 3 grams during the first two years—suggesting that the first cases done will probably develop recurrent obstruction, while the last ones probably will not.

Unfortunately, no one has yet been able to report the late results of resection done for relatively large glands sufficiently long ago to permit the drawing of conclusions as to the incidence of recurrence, but these data will be available before long.

There is no doubt that the immediate results are satisfactory, and that symptoms can be relieved in all but the largest glands, which constitute 5% or less of all obstructing prostates.

The indications for the employment of resection instead of prostatectomy depends upon the individual surgeon. If he is relatively inexperienced or if he is prejudiced against the method, he will probably limit his efforts to the contracted, fibrous glands, small carcinomas, and to small hypertrophies of the median lobe, while the operator of greater experience may readily and safely remove more than a hundred grams of pros-

tatic tissue uninfluenced by the anatomic type of hypertrophy present and will perform prostatectomy in but two to five per cent of the cases. I am certain that this will continue to be true unless an unexpected number of recurrences takes place in the future. The general surgeon will probably continue to confine himself to prostatectomy. Indeed, in the hands of the man who performs cystoscopy and operates upon the prostate only occasionally, two-stage supra-pubic prostatectomy will remain the treatment of choice unless we experience unforeseen developments in therapy with the X-ray or with endocrine preparations both of which, at present, appear to promise but little.

Summary of Results

Between April 1930 and February 1937, I have done 707 resections on 574 patients. In 1930, 18 patients underwent resection while 25 were submitted to prostatectomy. In 1936, 160 (98.2%) underwent resection and three prostatectomy (1.8%).

The patients averaged 66 years of age, 30% being past 70, and 4% past 80, while one was 5 and one 16 years old. 52% had complete retention of the urine, and the residual averaged 460 cc. before operation. Preliminary cystostomy was done in 11% (6% in 1936) either for impaired renal function, acute infection or the removal of large stones.

83 patients (15%) had cancer, 20 of which were treated by litholapaxy, 43 (7%) had stones, 20 (3.8%) had neurogenic vesical dysfunction, and 12 (2%) had diverticula large enough to require removal; in other words, there was complicating local pathology in 27%, nearly all had pus in the urine; the two-hour phthalein excretion averaged 50%.

20% of the patients had two resections before leaving the hospital, and a very few had three. The amount of tissue removed averaged 3 grams per patient in 1930 and 26.6 grams in 1936. Only one patient has been refused operation, and this because of far advanced pulmonary tuberculosis.

There have been 21 deaths or 3.6%. By a process of calculation well-known to the profession, this can be reduced to 2.8%, but I cannot justify it.

In general, the results have been good, the postoperative residual having averaged less than 30 cc. Deaths have been due to infection, and this has been responsible for more of the postoperative complications such as epididymitis, periurethritis, pyelonephritis, etc. There have been 12 (2%) postoperative hemorrhages, 4 of which (0.66%) have required cystostomy. Partial incontinence for 24 hours is not uncommon, and a few patients have left the hospital incontinent but only one of the whole group has remained so.

Pyuria occurs postoperatively in all the patients, but usually is not associated with symptoms and disappears after 6 to 12 weeks. Hence it is not treated unless it persists beyond that time.

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Discussion

Dr. J. M. HAYES: I would like to ask Dr. Creevy if he thinks now that he might have prevented some of these post-operative complications by more careful preoperative preparation if he could have foreseen these untoward results.

Dr. C. D. CREEVY: Pyelonephritis as a postoperative complication is often attributable to the operator's bad judgment in operating with insufficient preparation. Patients without fever and with normal renal function require no preparation; those with functional impairment require preliminary drainage, with the catheter in mild impairment and by cystostomy if the renal damage is severe.

I do not believe that postoperative pyuria can be avoided in most cases.

Dr. DONALD MCCARTHY: I wonder if it would be within the realm of this paper to discuss what you really believe the criteria for proper preparation. Do you consider phthalein and urea alone, or do you consider evidence of infection, or both?

Dr. C. D. CREEVY: The principles I have tried to follow are briefly these: if the patient's phthalein is good, (50% or more in two hours), and the temperature is normal, I do not care whether he has pus in the urine or not. If he is afebrile he is taking care of the infection and is ready for operation. If the phthalein is reduced I use an inlying catheter until it has come back to a normal level or until I am convinced that it won't when I use a cystostomy. If the patient has a very severe impairment when he comes to the hospital I prefer to make a cystostomy first.

The tone of the bladder must also be considered. If the bladder is very flabby the patient needs preparation even though his phthalein is normal and he is afebrile. Such a patient may even require a cystostomy.

There are other conditions which must be considered such as cardiovascular lesions, anemia, *etc.* A considerable number of our cases are transfused preoperatively, or have a period of therapy for cardiac disorders before operation.

Dr. DONALD MCCARTHY: Has the question of gradual decompression gone by the boards?

Dr. C. D. CREEVY: I am a bad one to ask about that because I have never employed it. I once spent two or three years going over the literature but I could not find any evidence that there was a lesion that could be attributed to the rate of emptying the bladder. I think it is a question of infecting the patient. They have adopted this view at the Mayo Clinic, but the textbooks still speak of gradual decompression.

I once went over the cases for two comparable periods of years at the Mayo Clinic with this in mind. In 1917-1918 they simply put in a catheter and emptied the bladder. In 1921-22 they employed gradual decompression. I found no difference in the mortality from catheterization between those two periods.

Every urologist knows about some patient who died as a result of a sudden emptying of the bladder but no one can furnish the details. The idea is very firmly fixed in all the textbooks, but I can find no proof of it. I have never had any ill effects that I can attribute to the rate of emptying of the bladder. If patients die after emptying of the bladder they die of infection. I could not find in the literature any record of a complete autopsy on one of those patients.

Dr. ROBERT P. CARON: I would like to ask Dr. Creevy the clinical indications for prostatectomy.

Dr. C. D. CREEVY: I do not think that one can make any hard and fast rules as to the amount of residual urine which constitutes an indication for transurethral resection. If the patient is comfortable, he may do well indefinitely with 100 cc. of residual. A very definite indication occasionally exists in the absence of residual urine in patients who have the most extreme difficulty in voiding and who get no benefit from prostatic massage and dilation. Such people may get the most gratifying results from prostatic resection. I have recently had a patient who never had more than 45 cc. of urine but who had a great deal of difficulty in emptying his bladder and resection relieved him completely. The result is just as gratifying to him as if he had had a large retention. If the patient is comfortable, has

good renal function and isn't losing a lot of rest, I do not see any reason for operating on him.

Dr. ROBERT P. CARON: Is prostatic massage very beneficial in these older persons?

Dr. C. D. CREEVY: Some patients will get relief from massage if part of the enlargement is due to prostatitis, but if it is all due to true hypertrophy they won't. The only practical way of discovering these patients is to try massage and see if it relieves them, (I always explain it may or may not).

PROCEEDINGS

MINNESOTA ACADEMY OF MEDICINE

Meeting of April 14, 1937

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, April 14th, 1937. The meeting was called to order at 8 o'clock by the President, Dr. E. M. Jones.

There were 50 members and 1 guest present.

Minutes of the March meeting were read and approved.

The scientific program followed.

NOTES ON A COMMON TYPE OF EMOTIONAL PROBLEM ENCOUNTERED AMONG COLLEGE STUDENTS

E. M. deBERRY, M.D.

Dr. deBerry, University of Minnesota, read his Inaugural Thesis on the above subject.

Summary

1. It is possible to describe a psychiatric syndrome characterized by self-consciousness, shyness, feelings of unworthiness and insecurity.

2. Cases falling into this group have, because of circumstances, misinformation, ignorance, *etc.*, been led to interpret certain experiences as evidence of inferiority in themselves.

3. Their reaction to this is the natural one of self-consciousness, withdrawal from group and personal contacts, with the development of pathological compensatory day-dreaming closely resembling the production of schizophrenia.

4. Because of the accessibility, as contrasted to the inaccessibility of the schizophrenic, the physician is able to observe the causal relation existing between the patient's behavior, his emotional disturbance, and his previous experiences. He is able adequately to explain the syndrome in terms of experience without resort either to physical factors on the one hand, or to deep psychological analysis on the other.

5. Since the etiology of the self-conscious syndrome may be adequately explained in this manner, and since this condition closely resembles schizophrenia, it is suggested that investigation in this pre-psychotic field should throw considerable light on the etiology of the more serious disease.

Discussion

Dr. W. H. HENGSTLER, St. Paul: This splendid presentation of Dr. deBerry touches a field in psychiatry which has grown tremendously in the last ten years. Those of us practicing psychiatry are thought by many to deal only with the insane, but the greater part of our practice today is with these emotional disorders. Dr. deBerry is fortunate in seeing a wealth of material in the adolescent period and to be able to see these conditions in their incipency, that we see in the adult and their struggle in competition with the world. I was very glad to have him say what he did about masturbation. In these emotional cases, the problem of masturbation is invariably present. It even pops up in the involutional period of life and offers the basis for the type of depression which leads to suicide. The tendency of all these people who have these emotional disorders is to go to the public libraries and get some book and read all about what some layman has said about it. The most common question asked of the psychiatrist is "what books can you recommend for me to read to help solve my problem?" Of course there is nothing worse than a book written by a layman describing all the signs and symptoms of his own experience and trying to tell the rest of the world what to do about it. The best advice would be that the patient go to a good psychiatrist and have him get his information from that one

source. I recall one case which shows very well this sudden feeling of inadequacy in these patients. This young man was a perfectly normal young man, employed by a large corporation, and a graduate of a mining engineering school. He was perfectly normal until he became involved in an affair with a girl whom he later married because he had to. After the wedding he continued normal until the birth of a baby which was about one month prior to the necessary gestation period. After that, when he reported for work, he got the idea that everyone in his office knew about this and he began to blush; and ever since then he has been unable to approach friends or any one in the office without this sensation of blushing and intense perspiration. It has so interfered with his work that he is completely demoralized.

I want to express my appreciation of Dr. deBerry's contribution. I think there is nothing more important than these disorders of personality; it is a subject worthy of the consideration of every doctor practicing medicine.

Dr. DEBERRY, in closing: There is nothing much to add except possibly in response to Dr. Hengstler's remark about reading of books written by laymen. The reading of books written by psychiatrists is even worse. The layman may invent terms, but the psychiatrist has it all over the layman in inventing terms. Physicians are particularly careless in what they say, perhaps because these books are supposed to be read only by physicians. They are read by laymen, however, on whom they have quite a different effect. It seems to me this problem (certainly my problems at the University) would be lightened if medical books were not available to students and the general public.

OSTEOCHONDROMATOSIS OF THE KNEE JOINT

ARTHUR W. IDE, M.D.

ST. PAUL

This patient, J. C. C., has been for many years employed as a railroad freight conductor. He is 52 years old, and has been under observation and treatment for the last year on account of trouble with his right knee.

He gives a history of first injuring this knee when he was 14 years old. At that time he was shot with a 22 caliber bullet. The bullet penetrated the skin just below the patella and emerged in front of the patella. It probably did not enter the joint. The wound healed in about three weeks and gave him no serious difficulty at that time or later. About three weeks after this injury, the patient fell over a stump and injured his knee again. The knee was injured by some splinters from this stump and the resulting wound was slow in healing. He says it "festered". It took him five or six weeks to recover from this injury, but, once healed, it gave him no further trouble.

About six weeks later, he struck this knee again. At that time he was working as a brakeman on the railroad and injured the knee while handling freight. He was struck above the knee by a heavy fly-wheel which he was handling. He was unable to work for only two weeks at that time, but he thinks that this accident damaged the knee considerably. After that, he worked for about 25 years without serious trouble. He does not think he had any disability whatever in this knee during those years.

The next time he experienced any difficulty was in 1934. At that time he noticed some little trouble with this knee, but there was no serious inconvenience. In May 1935, he was taken seriously ill with pneumonia and did not regain his health until October 1935. When he recovered from this pneumonia, the knee began to give him some trouble. Prior to that time he had felt a small lump above the patella but he had not given the matter any serious consideration.

As a young man he had worked as a brakeman on freight trains and during the later years he had been a conductor on a freight train. He was able to get about very well even in these occupations.

Following his sickness in 1935, he went back to work in December. At that time he began to have stiffness and pain in his right knee. The knee gradually became worse. In spite of this trouble, he worked for six months before reporting for X-ray examination. He was still able to work at his job as

conductor on a freight train, but, on account of this trouble, his occupation was changed in August 1936 and he went to work as conductor on a passenger train. He was able to handle this job until December 1936. At that time his knee became so bad that he was not able to work at all and he was pensioned on a basis of total disability.

Since that time he has not been able to get about except on crutches and even with his crutches he has considerable difficulty. The knee is painful when he puts his weight on it and it is also painful when he bends the joint.

X-ray pictures, taken in July 1936, showed many irregular bodies in the joint and in the connecting bursa. These bodies are found in all parts of the knee joint and in the bursa. They are particularly noticeable posteriorly. There is also a very noticeable roughening of the articular surface of the joint and there is other evidence of arthritis.

X-ray pictures, taken in February 1937, show evidence of progress in the arthritic condition in this joint. The diagnosis in this case is one of osteochondromatosis with an accompanying arthritis.

Osteochondromatosis is a rare condition characterized by the formation of bodies in the joint. These bodies are pedunculated and may become detached and form loose bodies in the joints. They occupy the joint spaces and connecting bursa. This disease is usually non-articular. Various joints may be affected, but the knee is the joint most commonly affected. Osteochondromatosis is a clinical entity and should not be confused with other conditions where loose bodies are found in the joints.

Rixford, in 1930, referred to 80 cases which were reported up to 1929 and he added 5 cases, bringing the total number of cases reported to that date up to 85. These figures indicate a rarity of this condition which is probably not borne out by the actual facts. Undoubtedly this condition is far more frequent than these figures would indicate.

Etiology. There are four factors that are considered important in the etiology of this condition, namely, infection, trauma, embryonic rests, and neoplasm. Infection has not been given a very prominent place in the consideration of this condition. In the case here reported, infection is undoubtedly a complicating factor, but not an etiological factor. Undoubtedly this patient has had an osteochondromatosis for many years but has had no disability from it until recently. The disability has been due to the complicating arthritis. He had a severe respiratory infection with a resulting arthritis in this diseased knee joint.

It is surprising that these patients do not have more disability in these joints that contain so many loose bodies. Undoubtedly this patient worked in railway train service for many years with this knee when it contained a great many of these bodies. He did not know there was anything particularly wrong with the knee during most of this time. The real disability began when the arthritis developed.

Disability in these uncomplicated cases comes from locking of the knee joint, the same factor that produces disability in ordinary cases of foreign bodies in the joints. Trauma is undoubtedly a factor in the consideration of this condition. However, it is not thought to be a cause of the condition. These bodies may be broken from their pedicle by trauma and undoubtedly trauma is, in many instances, a complicating factor in causing disability in these joints. Most of these cases give a history of trauma, as does this case. Just how much effect the trauma has had is problematical.

It is quite likely that embryonic rests are important etiological factors. These bodies apparently grow from the synovial membrane, particularly near the attachment of this membrane to the articular cartilage. These bodies grow out and are connected with the synovial membrane by means of stalks. These stalks may be broken off and in this way the bodies may become loose in the joint. It has been suggested that these bodies may continue to grow after they do become loose in the joint. If this is the case, it is perhaps one of the best examples of a body growing *in vivo* without definite connection with other structures. It is possible that the joint fluid may nourish these bodies and cause them to grow. It would seem

reasonable that this may occur, but this has never been demonstrated.

Ewing describes the microscopic appearance of one of these bodies as follows: "It appears to be an ossifying, papillomatous synovitis that has taken on the aspects of a benign neoplasm. Microscopically, these bodies show a cartilaginous formation with a tendency toward calcification."

It is argued that this is a neoplasm; however, it is never a malignant growth.

Henderson has reported one case of osteochondromatosis with chondro-sarcoma of the femur. This is, so far as I know, the only case reported of this condition with a malignant condition coexisting.

Diagnosis. Diagnosis is made by X-ray. Undoubtedly these bodies exist before they can be demonstrated by X-ray. This can be shown only when the calcifying process is developed to such an extent that the X-ray will show the shadow.

Treatment. The treatment is surgical. In uncomplicated cases the joint is exposed by an appropriate incision and the bodies are removed as completely as possible. It has been suggested that a thorough flushing of the joint with saline solution under pressure may dislodge bodies that otherwise might be overlooked. A complete synovectomy may be advisable.

In the case here reported, surgical treatment has been delayed because of the coexisting arthritis. The knee has been immobilized and when the arthritis has subsided surgical treatment will be instituted.

Discussion

Dr. ARNOLD SCHWYZER, St. Paul: My experience with this condition has been in just one case. It involved the elbow. There were very large bulky masses. The parts removed, completely filled a 2-ounce vaseline bottle. What Dr. Ide said about not being hesitant at removing large parts of the affected synovialis is important. I had to cut out the major part of it and the result was very good. I think this is quite a promising case, but unless one opens the joint very widely, frees the tendon of the quadriceps, and gets at the posterior recesses of the joint, one could not expect very much of a result in such a case.

Dr. KENNETH BULKLEY, Minneapolis: I would like to ask Dr. Ide how he plans to expose the joint when he does do some surgery on it.

Dr. IDE, in closing: I am inclined to think that I will use the "U" shaped incision and saw the patella transversely. This undoubtedly gives the best exposure. This is desirable in this case. A radical operation should be done. I believe we will eventually get a satisfactory result.

SOLITARY CYST OF THE KIDNEY

Report of Two Cases

ARNOLD SCHWYZER, M.D.

ST. PAUL

The first case was in a woman 55 years of age who had had seven children. For about a year she had suffered from some substernal pain and from nausea. The nausea had, however, disappeared during the last months. In the left side of the abdomen one could readily feel a large rounded mass reaching down from under the left ribs to the level of the iliac spine and within an inch of the midline at the level of the navel. Palpation was sensitive. A retrograde pyelogram demonstrated a normal right side, while the left kidney shadow reached to the iliac spine and a fainter contour to the lower end of the sacro-iliac synchondrosis. The renal pelvis was rather stretched inward and the lower calyx appeared widened and elongated. The loss of its terminal endings and the rounded bulky contour, instead of a bulging inward as seen in tumors invading the calyx lumen, made the roentgenologist correctly suspect a large cyst. The examination of the patient had allowed us to make this diagnosis beforehand as the tumor was ideally round and smooth and there was no cachexia or serious constitutional change. The ureter as you can see (X-ray film shown) was forced mesially onto the shadow of the spine. The solitary cyst had the dimensions of a large-sized grapefruit.

At operation the upper pole of the kidney did not have to

be meddled with. A catheter was simply thrown around the narrows between lower pole and cyst. This gave a good hold. The lower pole was resected while step by step the kidney was sutured as the division through the parenchyma progressed. Recovery was uneventful.

The second case was a woman, 35 years old, who had had three children. She gave a history that four days previous to her first visit at the office she felt a pain in the right iliac. She appeared rather debilitated, pale and pasty, had no appetite and eating gave her cramps. Her hemoglobin was 70 per cent. The right kidney was markedly ptotic and flopped around in the abdomen very freely. It could readily be rotated, as it seemed, in any direction and could easily be brought over the spine into the midline and with its lower half into the greater pelvis. However, this was not the area of the pain. The cecum was bulky and was the seat of the pain. On the kidney was felt a rounded protuberance the size of a tangerine.

In a pyelogram the left kidney appeared normal in size, shape and position. The right one was described as markedly ptotic when the patient was standing and as rotated around its horizontal transverse axis. The upper and lower calyces were foreshortened and superimposed upon each other.

At operation we removed the appendix through a small grid-iron incision. It was moderately irritated and on microscopic examination showed recent irritation by groups of round cell infiltration. The kidney was readily brought to this appendectomy wound and through the posterior peritoneum one could see the bluish cyst very clearly. After closing the wound, a lumbar incision was made, almost half of it over the erector spinae. Anteriorly from this muscle, the muscles were pulled apart widening the triangle of Petit and hardly cutting any muscles. The kidney was brought into the wound, but not outside, and the cyst removed by resection of the adjoining kidney parenchyma. The cyst was located in the middle of the posterior surface of the kidney and was the size of a lemon. The kidney wound was sutured and there was no leakage of urine later on, though the pelvis had been opened. However, the wound in the retroperitoneal space was unusually large and required good draining with rubber tissue. The last of the rubber drains were removed on the 12th postoperative day. The fat was thoroughly removed from the quadratus and posterior muscles and from the posterior surface of the kidney to guard against a recurrence of the kidney floating about. After the operation she was given 550 cc. of blood. Since the patient left the hospital I have not seen her as yet. I feel quite sure that this kidney will not become troublesome any more on account of an abnormal mobility.

A third case may be seen here. (X-ray film shown.) The pyelogram was kindly loaned to me by Dr. Meddeman. The outlines of the cyst are unusually clearly seen. They measure six inches in the transverse diameter. Downward the shadow reaches the upper level of the iliac crest.

These solitary cysts of the kidney are usually at one of the poles and most frequently at the lower. Their relation to polycystic kidneys is problematical, and surely in their clinical course they differ greatly from polycystic kidneys. Their origin lies probably in some congenital malformation, possibly in an early inflammatory process, but this latter is pure conjecture based more or less on the frequently seen multiple small cysts in chronic interstitial nephritis.

The meeting adjourned.

A. G. SCHULZE, M.D.

Secretary.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

St. Paul, Minnesota

DOCKET OF CASES

STATE OF MINNESOTA *versus* CHESTER E. PAUL
(two cases).

On April 2, 1937, one Chester E. Paul, 36, a chiropractor, performed an abortion on a 24-year old St. Paul girl who died

on May 19, 1937, in Ancker Hospital, St. Paul. On June 8, Paul pleaded guilty to the crime of abortion, an indictment having been returned on May 21 by a grand jury. When he surrendered his basic science certificate and his chiropractic license in open court, he was allowed to plead guilty, and Judge Richard D. O'Brien sentenced him to a term of not more than 4 years in a state penal institution; then placed him on probation in the custody of the Ramsey County probation officer. His basic science certificate and his chiropractic license have been cancelled.

NEWS ITEMS

Dr. John Francis Quinn, Elkton, S. D., has removed to Waubay, S. D.

Dr. Francis Kenneth Waniata, formerly of the Miles City General Hospital in Montana, has taken up practice at Great Falls, with offices in the Strain Building.

Dr. Murdock MacGregor, Fargo, is chairman of the state executive committee (for North Dakota) of the American College of Surgeons.

Dr. Hans C. Ericksen, formerly of Wyndmere, N. D., has taken the place of Dr. Ernest L. Grinnell, of Aneta, in Nelson County.

Dr. Neil T. Norris, St. Mary's Hospital in Minneapolis, will associate with Dr. Garnett B. Belote, at Caledonia, Minn.

Dr. John R. Westaby, Madison, motored to Atlantic City, where he was South Dakota's delegate to the meeting of the American Medical Association in June.

Dr. Lloyd Arthur Smith, Watford City, N. D., a graduate of the University of Minnesota Medical School in 1934, will inaugurate practice in Balaton, Minn.

Dr. Archie Merle Smith, formerly of the Bratrud Clinic at Thief River Falls, has opened new offices in Hopkins, Minn.

Dr. John Dickinson Carr, for several years superintendent of the North Dakota State Hospital for the Insane at Jamestown, has resigned.

Dr. J. H. Garberson, Miles City, Mont., spoke on "Recent Advances in Medicine" on June 29 before the Miles City Rotary Club.

Dr. John A. Kittelson, Sioux Falls, S. D., has been appointed Minnehaha County physician. He took office on July 1st.

Dr. Emil Ericksen, Sioux Falls, South Dakota, has been re-appointed city health officer of Sioux Falls for one year.

A fund is being collected by the Minnesota State Medical Association for the purpose of establishing a memorial to the late Dr. Herman M. Johnson, who lived at Dawson.

At the annual meeting of the Montana State Medical Association held at Great Falls July 13-14, Dr. J. C. McGregor, Great Falls, was elected president-elect. Other officers are Dr. E. D. Hitchcock, Great Falls, vice-president, and Dr. Thomas L. Hawkins of Helena, secretary. Dr. William P. Smith, Columbus, is the president for this year.

Mrs. Stephen H. Baxter, wife of Dr. S. H. Baxter, Minneapolis, died on July 29 at the home of her daughter, Mrs. Benjamin E. Thurston, at West Point, N. Y.

Dr. C. W. Froats, formerly of Thief River Falls, Minnesota, is now associated with Dr. E. C. Hartley in the practice of obstetrics and gynecology, at Saint Paul.

Dr. Amos Leuty, 69, Morris, Minn., died at Morris on June 24. He was a graduate of the old Drake University College of Medicine (Des Moines, Ia.) in 1898; and came to Morris in 1903.

Seventy-five pre-school children were examined at a child health clinic in Cavalier, North Dakota, by Dr. August Costello Orr, of the division of child hygiene, North Dakota State Board of Health.

Dr. David W. Mackenzie, chief of the urological service in the Royal Victoria Hospital at Montreal, Canada, was elected president of the American Urological Association at its recent meeting in Minneapolis.

Dr. Robert Catey, of Mobridge, S. D., first lieutenant in the United States Army Medical Reserve Corps, is now in Chicago, where he is completing his internship at the Norwegian-American Hospital.

Dr. Galen Krauth Sellers, Morley, a graduate of the University of Illinois College of Medicine in 1929, has removed to Dassel, Minn., where he will practice henceforth.

Dr. Arthur Thompson, of Cokato, Minnesota, who maintains an office in the Cokato Hospital, where he is medical director, has opened another office in the Cokato State Bank Building.

Lewis & Clark County in Montana is expecting to build an \$80,000 hospital at Helena to be financed in part through the Works Progress Administration. It is to be earthquake-resistant and acoustically treated.

Dr. Frank Ward Bilger, Hot Springs, South Dakota, has been named a member of the medical staff of the American Boy Scout jamboree at Vogelenzang, Holland. He will leave this summer, and return to Hot Springs in September.

Dr. Myron O. Henry, of Minneapolis, instructor in orthopedic surgery in the University of Minnesota Medical School, gave an orthopedic clinic on "Fractures of the Neck of the Femur" before the South Dakota State Medical Association at Rapid City on May 25.

Dr. Leonard Jerome Monson, of Hendricks, Minnesota, a graduate of the University of Minnesota Medical School in 1934, will locate at Canby, Minnesota. Dr. Robert T. Potter, of Minneapolis, will take Dr. Monson's place in the office of Dr. Peter E. Hermanson, of Hendricks.

Dr. William A. O'Brien, associate professor of pathology and preventive medicine at the University of Minnesota, will talk on these dates for the broadcasting schedule of the Minnesota State Medical Association: August 7, "Pre-school Examinations"; August 14, "Coronary Occlusion"; August 21, "Sore Throat"; and August 28, "Dental Anesthesia." Station WCCO (810 kilocycles or 370.2 meters), 9:45 A. M., each date.

Of 1,264 students enrolled in the 6 Lewis and Clark County schools in Montana, 790 have been given Mantoux tests, according to the Montana Tuberculosis Association; and 201 students were reactors.

A \$170,000 woman's ward building will be erected at the South Dakota State Hospital for the Insane at Yankton. The legislature has appropriated \$93,500 and the Public Works Administration has allocated \$76,500 toward it.

Dr. Louis B. Wilson, professor of pathology and director of the Mayo Foundation at Rochester, retired on June 30. The board of regents of the University of Minnesota appointed Dr. Donald C. Balfour as Dr. Wilson's successor.

Dr. Leo G. Rigler, professor of radiology and director of the Cancer Institute of the University of Minnesota, spoke on "The History of the American Registry of Technicians" at the American Society of X-Ray Technicians meeting in Denver, Colorado, on July 6.

Dr. John James Gelz, 54, of St. Cloud, Minn., a graduate of the Minneapolis College of Physicians and Surgeons in 1909, and a fellow of the American College of Surgeons, died in that city on June 26. He was a past president of the Stearns-Benton County Medical Society.

Dr. Jacob Fowler Avery, 62, who practiced in Minneapolis, died at LaJolla (San Diego), Calif., in June. Dr. Avery was a graduate of the University of Minnesota Medical School, a member of the American College of Physicians, and a major in the Medical Corps during the World War.

Dr. Arthur A. Zierold, professor of surgery in the University of Minnesota Medical School, has become a member of the American Surgical Association. This group has only 150 members in the United States, and Professor Owen Wangenstein, chief of the department of surgery, is the only other member in Minneapolis.

Dr. Charles A. Donaldson, 74, of Mesa, Arizona, died on May 3, 1937, it has been learned. He was once president of the Hennepin County Medical Society, was a member of the American College of Radiology, and came to Minneapolis in 1888. He went to Arizona in 1925.

Dr. Elmer Harry Hansen, of Menno, South Dakota, formerly of Princeton, Minnesota, was sentenced in Minneapolis on June 14. Dr. Hansen pleaded guilty to a charge of selling narcotics in Princeton in September and October, 1936. He is a graduate of the Tulane University Medical School at New Orleans, in 1914.

Fifteen physicians have been licensed to practice medicine in North Dakota. They are: Drs. Edith E. Norman, Fargo; Ralph E. Mahowald, Grand Forks; Amos R. Golsdorf, Dickinson; Joseph D. Craven, Williston; Robert R. Saint Clair, Leslie R. Grams, Willard W. Hall, and Herbert Brunner, of Minot; Bernard L. Sinner, Fargo; Paul Reed, Langdon; Jesse H. Roth, Jamestown; Irving W. Kellogg, Fairmount; Robert F. Nuessle, Bismarck; and Woodrow Nelson and William E. Olson, of Larimore.

Dr. W. A. Gerrish, Jamestown, North Dakota; Dr. Jesse W. Bowen, Dickinson; and Dr. William C. Fawcett, Starkweather, were named to the North Dakota State Board of Medical Examiners by Governor William Langer.

Dr. Sidney Alexander Cooney, of Helena, Montana, secretary of the Montana State Board of Medical Examiners, is the new president of the Lewis & Clark County Medical Society. Dr. Everett Harry Lindstrom was elected vice president; and Dr. William Francis Cashmore, Jr., Helena, secretary-treasurer.

The University of South Dakota School of Medicine, which offers a 2-year course in medicine, has been granted provisional rating by the Council on Medical Education and Hospitals of the American Medical Association, according to Dean Joseph C. Ohlmacher, M.D., of Vermillion, South Dakota. The school will be inspected in 1939 for final rating.

Dr. Irvine McQuarrie, professor of pediatrics and chief of the department, and Dr. Chester A. Stewart, clinical professor of pediatrics and a member of the Board of Editors of THE JOURNAL-LANCET, both of the University of Minnesota Medical School, will address the International Pediatric Congress at Rome, Italy, on September 27-30.

Three professors in the University of Minnesota Graduate School of Medicine at Rochester shared the gold medal awarded by the Committee on Scientific Exhibits of the American Medical Association at Atlantic City in June. They are: Drs. Melvin S. Henderson, professor of orthopedic surgery; Henry W. Meyerding, associate professor of orthopedic surgery; Ralph K. Ghormley, associate professor of orthopedic surgery; and H. B. Macey, of the Mayo Clinic.

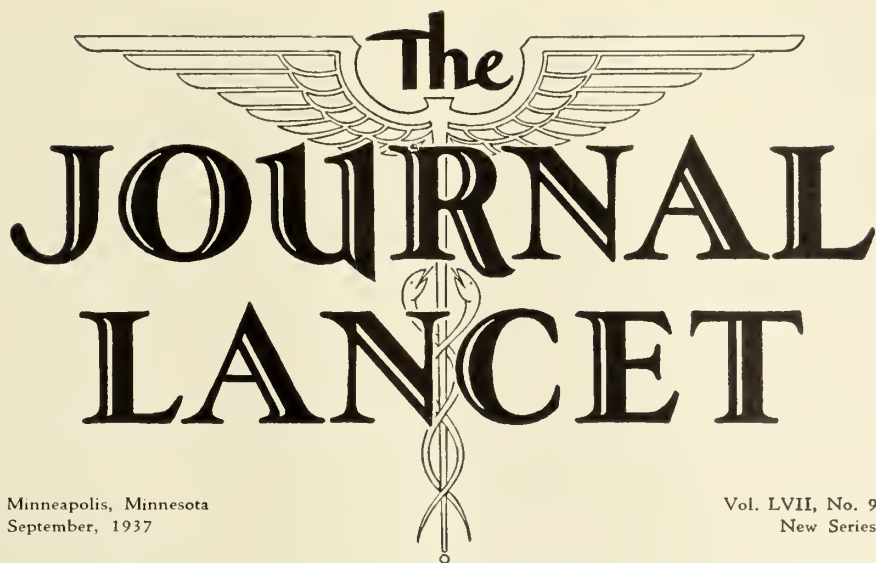
The International Assembly of the Inter-State Post-graduate Medical Association of North America, under the presidency of Dr. John F. Erdmann of New York, will be held in the beautiful new public auditorium of St. Louis, Missouri, October 18, 19, 20, 21 and 22, with pre-assembly clinics on Saturday, October 16 and post-assembly clinics, Saturday, October 23, in the hospitals of St. Louis.

The aim of the program committee, with Dr. George Crile as chairman, is to provide for the medical profession of North America an intensive post-graduate course covering the various branches of medical science. The program has been carefully arranged to meet the demands of the general practitioner, as well as the specialist.

A complete list of the distinguished teachers and clinicians who will take part on the program will be found in the September issue of this journal.

A most hearty invitation is extended to all members of the profession who are in good standing in their State or Provincial Societies to be present. A registration fee of \$5.00 will admit each member to all the scientific and clinical sessions.

For further information, write Dr. W. B. Peck, Managing-Director, Freeport, Illinois.



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Fifty-Sixth Annual Session—1937

Rapid City, South Dakota

May 24, 25, 26, 1937

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South Dakota State Medical Association Fifty-Sixth Annual Session, Rapid City, South Dakota

Monday, May 24th, 1937, 4:00 P. M.

Alex Johnson Hotel

FIRST SESSION COUNCIL

The Council was called to order by H. R. Kenaston, chairman, at 4:00 p. m. in the ballroom of the Alex Johnson Hotel.

Roll call; the following were present: J. L. Stewart; E. A. Pittenger; J. F. D. Cook; J. R. Westaby; J. D. Whiteside; C. E. Sherwood; B. M. Hart; J. C. Shirley; O. J. Mabee; S. M. Hohf; H. R. Kenaston; N. K. Hopkins. *A quorum present.*

In the absence of Dr. W. E. Donahoe, Motion by E. A. Pittenger supported by S. M. Hohf that Dr. N. J. Nessa be seated as counselor for the Sioux Falls District. *Motion carried.*

Motion by S. M. Hohf supported by J. R. Westaby that Dr. P. D. Peabody be seated as councilor, as requested by his councilor and secretary of his district for Whetstone Valley District. *Motion carried.*

Secretary presented for approval the minutes of the 1936 annual session as printed in the July issue of THE JOURNAL-LANCET 1936.

Motion by O. J. Mabee supported by C. E. Sherwood that the minutes of the annual meeting of 1936 be approved as printed in JOURNAL-LANCET without being read. *Motion carried.*

Secretary Cook read the minutes of the quarterly meetings. Motion by C. E. Sherwood supported by E. A. Pittenger that the minutes be approved as read. *Motion carried.*

Minutes of Meeting of Council

Huron, S. D., July 2, 1936.

Council met at the Marvin Hughitt Hotel; noon.

On roll call the following were present; Drs. J. D. Whiteside; C. E. Sherwood; B. M. Hart; J. C. Shirley; S. M. Hohf; H. R. Kenaston; N. K. Hopkins; A. S. Rider; B. A. Dyar; E. A. Pittenger and Secretary Cook. A quorum being present, Chairman Kenaston called the meeting to order. The secretary announced telegrams from Drs. Flett and J. L. Stewart, who were unable to be present on account of illness.

Communications were received regarding a vacancy occurring on the State Board of Health and Medical Examiners, with suggestions that the council submit a list of candidates to Governor Thomas Berry, for his consideration in making an appointment.

Dr. S. M. Hohf said that Governor Berry indicated that he would gladly receive a list of names so submitted.

Dr. PITTENGER: How many names should we submit?

After a general discussion, it was decided to submit three names. On motion of Dr. Pittenger; that three names be submitted by the secretary of the council to the Governor for his consideration. *Motion carried.*

Dr. J. D. Whiteside moved that the name of Dr. J. B. Vaughn of Castlewood be submitted. Seconded by Dr. Pittenger, on vote carried. Dr. Shirley, Moved that the name of Dr. A. S. Rider, of Flandreau be submitted, Seconded by Dr. C. E. Sherwood; on vote carried. Dr. S. M. Hohf, Moved the name of Dr. W. A. Bates of Aberdeen be submitted. Seconded by Dr. Pittenger. *On vote carried.*

The Resettlement program of Medical, Dental, Hospital, and nursing care to Resettlement clients was considered.

Dr. B. A. Dyar, of the State Board of Health was asked to present the program. Dr. Dyar stated that he had conferred recently with the State Welfare Committee and also with Resettlement officials from Washington and Lincoln and that they desired a plan to be presented by the Medical Association.

The situation and a plan was discussed. Questions.

Dr. RIDER: Could they allot a certain amount to the counties?

Dr. DYAR: A certain amount is already given to the counties each month.

Dr. SHERWOOD: Would this plan apply to WPA and PWA?

Dr. DYAR: Yes, it would take care of all people that the government is helping. However, this plan would not set so good with the Pharmacists because Mr. Ward intimated that under this plan the doctors should dispense drugs and then put it on their bills.

Dr. HART: Wouldn't it be better to have this plan come through the Inter-Allied Council?

Dr. DYAR: Yes.

Dr. PITTINGER: I think it would be a good idea to have a committee appointed to bring this plan to the Allied Council and then bring it to the Allied groups.

Dr. DYAR: Yes, get the plan formulated and then hold meetings of the Inter-Allied Council.

Dr. RIDER: I think we should find out what other states are doing.

Dr. HOHF: I move that Drs. Hopkins, Pittenger, in coöperation with Dr. Dyar act as a committee of the State Medical Association in formulating a set-up of Medical Relief as has been presented by Dr. Dyar. Motion supported by C. E. Sherwood. *Carried.*

Dr. HOPKINS: I am sure we can get coöperation in the Inter-Allied Council. We are going to back the Dentist's bill in the coming legislature.

Dr. SHIRLEY: I think we should be careful about the fee schedule in formulating this plan.

Dr. PITTINGER: If we find that we need some help on this committee, would it be possible to have some more members appointed on this committee?

Dr. DYAR: Yes. *Discussion of medical relief concluded.*

Dr. SHERWOOD: I think that these medical lectures have been very much worthwhile and I would like to offer for this council a resolution commending the State Board of Health for its work in this matter and our desire in the future to repeat it along this same line with other subjects offered, if possible.

Dr. HOHF: I second the motion. *Carried.*

Dr. HOHF: If it is to continue, I think that careful analysis of dates should be considered. Two of the three meetings in Yankton occurred on dates when other events in Yankton were being held. Now, on this matter of Broadcasting, we are now at the bottom of the well. I have one more paper to be submitted.

Dr. COOK: I have given ample notice asking for papers to complete this program. No response so far, from the districts. Dr. Pittenger suggested that this committee use papers that the Aberdeen District used in their local broadcasting station.

Dr. HOHF: Is there anything that can be improved or any suggestions that can be made?

Dr. COOK: We have received a very good and worthwhile service over WNAX. I do not believe that there are any recommendations as to the service rendered.

Dr. DYAR: Read the financial report of the Inter-Allied Meeting in Sioux Falls. SEE REPORT.

Meeting adjourned.

J. F. D. Cook,
Secretary.

COUNCIL MEETING

Pierre, S. D., September 22, 1936

This meeting was called at the request of councilors and a phone conference with Drs. Stewart and Pittenger. To consider a program to be presented by Dr. R. C. Williams, Washington, D. C., of the Resettlement Administration, to provide medical, dental, hospital, and nursing care to relief clients on resettlement.

On roll call; H. R. Kenaston presiding; the following officers were present: Drs. J. L. Stewart; E. A. Pittenger; J. D. Whiteside; M. J. Hammond; C. E. Sherwood; J. C. Shirley; B. M. Hart; O. J. Mabey; N. K. Hopkins; Chas. Flett; A. S. Rider; B. A. Dyar, Sec'y Inter-Allied Council; J. F. D. Cook, Sec'y. Letters and messages were received from W. E. Donahoe, S. M. Hohf and R. B. Fleeger, expressing their vote on resettlement program.

Dr. Pittenger of the Public Health Committee of the South Dakota Planning Board. Presented recommendation of the planning board, relative to the advisability of a separate board of Medical Examiners, to be divorced from the State Board of Health.

That the State Medical Association prepare such a bill to be presented to the 1937 legislature.

Dr. Rider moves, supported by Dr. Pittenger; That the Council approve the recommendations of the South Dakota Planning Board relative to the board of medical examiners and appoint a committee of three to assist in preparing such a measure and present same to the legislature. *On vote carried.*

Chairman Kenaston appointed as follows: T. F. Riggs; B. A. Dyar; J. C. Shirley, as the "Committee on Medical Licensure."

The subject of annual registration was considered; after a full discussion, it was decided to place this matter in the hands of the committee on medical licensure legislation as appointed by Chairman Kenaston.

At this time the committee report of N. K. Hopkins, President; E. A. Pittenger; and B. A. Dyar, Sec. of the Inter-Allied Council, was presented. This committee report having contacted the Resettlement administration at Lincoln, Neb., relative to a program of medical, dental, hospital and nursing care to resettlement clients.

It was anticipated when this meeting was called that Dr. R. C. Williams, Washington, D. C., of the Resettlement Administration would be present. Dr. Dyar was called upon for a report and he informed the council that Dr. Williams was unable to be present to present the Resettlement program for medical care.

Dr. Dyar gave a verbal report of the proposed plan, outlining the articles of incorporation of the SOUTH DAKOTA FARMERS AID CORPORATION. He stated that the committee felt that they had gone as far as they could without the coöperation of the council. A prolonged discussion of the plan was had.

Dr. A. S. Rider moved, That it be the sense of the South Dakota State Medical Association to approve the Emergency Relief set-up as presented by the committee, with the provision, as amended by the motion of Dr. O. J. Mabey, supported by Dr. Chas. Flett, "That after the councilor presented this plan to his District Medical Society, he may vote as directed by his society." Supported by Dr. J. L. Stewart. *Motion carried.*

A roll call vote was then taken on the adoption of the plan as presented for medical relief; FOR: J. L. Stewart; E. A. Pittenger; C. E. Sherwood; J. C. Shirley; N. K. Hopkins; A. S. Rider; *W. E. Donahoe; Chairman H. R. Kenaston. AGAINST: J. D. Whiteside; M. J. Hammond; B. M. Hart; O. J. Mabey; *S. M. Hohf; *R. B. Fleeger; Chas. Flett; J. F. D. Cook. **Voted by letter. Tie vote.*

Dr. Rider, moved that it was the consensus of opinion of the council that if this plan is put through, Dr. B. A. Dyar will act as Secretary to the South Dakota Farmers Aid Corporation. Duly seconded and carried.

A meeting of the council to be held as soon as the District Societies make their reports. Dr. Dyar promised to contact Dr. R. C. Williams of the Resettlement Administration and have him present at the meeting of the council when next convened, to further present the plan for medical relief to Resettlement clients.

Motion to adjourn was had; adjourned.

J. F. D. Cook,
Secretary.

Huron, S. D., October 20, 1936

Meeting called for 2:00 P. M. Marvin Hughitt Hotel. By Dr. B. A. Dyar, Secy. Inter-Allied council to meet with the Inter-Allied Council at which time Dr. R. C. Williams of the Resettlement Administration would present the program for medical relief to Resettlement clients.

Roll call; Drs. H. R. Kenaston; E. A. Pittenger; A. S. Rider; C. E. Sherwood; J. C. Shirley; N. K. Hopkins; S. M. Hohf; O. J. Mabey; J. D. Whiteside; B. M. Hart; (W. E. Donahoe,

by letter) W. H. Karlins; (Proxy Chas. Flett,) J. L. Calene, President; and J. D. Alway, Secy. Aberdeen District Medical Society. Quorum present.

After the Inter-Allied Council presented Dr. Williams and he presented the South Dakota Farmers Aid Corporation, program for medical aid to Resettlement clients and By-Laws covering same, which was presented for the first time.

The Council retired for the consideration of the plans of Dr. Williams. After a full discussion it was deemed advisable to defer action to study the By-Laws, which were presented the Council at this meeting, also to procure legal opinion.

Dr. S. M. HOHF; Moved, That the program proposed by Dr. R. C. Williams for medical aid to resettlement clients, be laid on the table for study and legal opinion, and to be considered at the next meeting of the council. Supported by B. M. Hart.

A. S. RIDER, moved to amend; by "stipulating that the time of postponement be sufficient to send an abstract of the By-Laws and a card to vote, for or against, to each doctor in the State. Supported by J. D. Whiteside." The amendment was duly considered and on vote was duly carried.

The original motion as amended was duly considered. Carried.

The secretary was directed to prepare such material as above, for the vote of the doctors in the state. Motion to adjourn, Adjourned at 5:00 P. M.

J. F. D. COOK, *Secretary*.

Huron, S. D., December 10, 1936.
Council meeting.

Roll call: Drs. J. L. Stewart; E. A. Pittenger; J. D. Whiteside; M. J. Hammond; C. E. Sherwood; B. M. Hart; J. C. Shirley; O. J. Mabey; W. E. Donahoe; S. M. Hohf; H. R. Kenaston; N. K. Hopkins; A. S. Rider; B. A. Dyar; J. F. D. Cook. Quorum present.

H. R. Kenaston presiding. Communication from Dr. Thomas Parran, Surgeon General U. S. Public Health Service, requesting the State Medical Association to appoint a committee, to act in an advisory capacity coöperating with the State Board of Health.

E. A. Pittenger moved, That a committee be appointed to act in an advisory capacity with the State Board of Health in the Public Health program for the control of syphilis. Supported by S. M. Hohf. *On vote motion carried.*

The following were appointed by the chairman;

Drs. C. E. Sherwood; R. G. Mayer; Anton Hyden.

Motion by C. E. Sherwood, supported by B. M. Hart, That the secretary write Dr. Thomas Parran, asking if transportation would be available for a representative from S. D. Medical Association to the National Conference on Venereal Disease control. *Carried.*

("The answer to this communication is to the effect that no provision for such funds.")

COUNCIL MEETING

December 10, 1936

Post card vote of the medical men of state, on the Resettlement program of medical aid. 478 cards were mailed. Cards returned 296. Voting yes 174. Voting no 122.

Dr. W. E. Donahoe presented certification of a change of vote of ten members of the Sioux Falls District from No to Yes. Which made the vote Yes 184, No 112.

Dean Searles, of Brookings was presented and gave a plea for coöperation in the Resettlement program.

Motion by C. E. Sherwood, Supported by M. J. Hammond; That the council endorse the Resettlement for one year, as a result of the poll. *Motion carried.*

At this time the members of the Allied-Council were invited to participate in the report to be given by Dean J. C. Ohlmacher, of the University Medical School.

In support of the University Medical School the following resolution was presented and duly adopted on motion of Dr. E. A. Pittenger, supported by C. E. Sherwood. A copy of the resolution to be mailed to the Council on Medical Education, American Medical Association, Wm. D. Cutter, Chicago, Ill.

Whereas, we have followed interest and understanding the activities of the School of Medicine of the University of South Dakota; have come to believe that it holds a very important place among the schools of higher education in the state, and

Whereas, the records of its students throughout the years of its existence have been a source of pride and gratification to us, and

Whereas, we feel that its continuance is essential to the best interests of the University of which it forms a part, and to the citizens of South Dakota, and

Whereas, we are firm in the conviction that it can be developed to meet the exacting requirements of modern day medical education,

Be it resolved that we, the representatives of organized medicine and allied professions of South Dakota, do hereby pledge ourselves to do all in our power to give such support for the school of Medicine as will enable it to meet the requirements of a Class A two year medical school.

Dated this 10th day of December, 1936, at Huron, S. D.

Representing the State Medical Association

Signed:

J. L. STEWART, *President*

J. F. D. COOK, *Secretary*

Representing Inter-Allied Council

N. K. HOPKINS, *President*, B. A. DYAR, *Secretary*

Medical Board of Licensure

B. A. DYAR, *Secretary*

State Board of Health

P. B. JENKINS, *Superintendent*

Motion that Dr. B. A. Dyar appoint the County Medical Committee as required in the Resettlement understanding, to audit the medical bill, if and when required. *Carried.*

Motion by W. E. Donahoe, supported by B. M. Hart That a notice of the resolution pertaining to the University Medical School be given to the Associated Press. *Motion carried.*

Motion by S. M. Hohf, That the secretary request Mr. George Kienholtz, to represent the State Association at the coming session and inform the officers of any and all bills introduced that may affect public welfare. Supported by C. E. Sherwood. *Motion carried.* Adjourned at 3:30 P. M.

J. F. D. COOK, *Secretary*

Financial Report of Secretary-Treasurer 1936

May 2, 1936. Cash balance in Aberdeen National Bank and Trust Co., Aberdeen, S. D.	\$ 790.74
Back dues received for 1936	201.00
1937 dues 248 members at \$8.00	1,984.00
12 dues at \$5.00	60.00
Sioux Falls District cash from exhibitors	50.00
Cash Bond and interest	555.00
Yankton district over paid dues	15.00
Sioux Falls District over paid dues	10.00

Total cash	\$3,665.74
Disbursements	\$2,602.20

May 19, 1937 Cash balance in Aberdeen Bank	\$1,063.54
Trust certificate Langford State Bank No. 375	735.92

Membership by Districts

Aberdeen District No. 1	34
Watertown District No. 2	24
Madison District No. 3	14
Pierre District No. 4	16
Huron District No. 5	15
Mitchell District No. 6	22
Sioux Falls District No. 7	32
Yankton District No. 8	33
Black Hills District No. 9	49
Rosebud District No. 10	8
Kingsbury District No. 11	7
Whetstone Valley District No. 12	11

Members	265
Honorary	5
Total	260
Total Doctors in State	562
Deceased	23
Retired	22
State Institutions and other facilities	49
Left state	10
	104 104
Total in practice	458

Motion by S. M. Hohf supported by C. E. Sherwood that the financial report of Secretary-Treasurer be accepted and referred to an auditing committee, such committee to be appointed by Chairman H. R. Kenaston. *Motion carried.* H. R. Kenaston appoints the following as auditing committee: C. E. Sherwood; B. M. Hart; S. M. Hohf.

Mr. L. M. Cohen, of Minneapolis, Minn., representative of THE JOURNAL-LANCET, was introduced by Secretary Cook.

Mr. Cohen expressed appreciation of being permitted to meet the council. He asked for expression of the councilors regarding the publication of THE JOURNAL-LANCET; any suggestions would be gladly received. Mr. Cohen stated that due to the financial conditions of the country, the price of THE JOURNAL-LANCET would be continued for another year at the price of one dollar and fifty cents per member (\$1.50).

Motion by C. E. Sherwood supported by E. A. Pittenger that the Council express to the editors of THE JOURNAL-LANCET their appreciation of the continued price of THE JOURNAL-LANCET as expressed by Mr. Cohen. *Motion carried.*

Secretary Cook presented a communication from Mr. J. H. Kean, Chairman of the Legislative Committee of the State Hospital Association, relative to a claim of that association against the State Medical Association for lobbying at Pierre relative to H. B. No. 39 and No. 40. The expense account was for \$300.00. After a discussion of their claim, motion by B. M. Hart supported by P. D. Peabody that this claim be laid on the table until further investigation of the account could be made, to be considered at the next quarterly meeting of the council. *Motion carried.*

No further business a motion to adjourn was had.

Adjourned at 5:30 p. m.

J. F. D. Cook,
Secretary-Treasurer.

SECOND MEETING OF THE COUNCIL May 26, 1937

Meeting called to order by Chairman, H. R. Kenaston; Roll call, J. L. Stewart; E. A. Pittenger; J. F. D. Cook; J. D. Whiteside; C. E. Sherwood; B. M. Hart; J. C. Shirley; N. J. Nessa; S. M. Hohf; H. R. Kenaston; P. D. Peabody; N. K. Hopkins; A. S. Rider; J. H. Lockwood. Quorum present.

The minutes of the Council meeting of May 24 were read and approved. Discussion of the claim of the State Hospital Association, as presented by Mr. J. H. Kean, Chairman Legislative Committee State Hospital Association was next in order. N. J. Nessa was asked to contact Mr. Kean and Rev. C. M. Austin of the Hospital Association relative to the claim. J. F. D. Cook to contact Geo. Kienholz of Pierre relative to this claim.

Secretary Cook, Moved that a vote of thanks be tendered to Black Hills District Medical Society, the Woman's Auxiliary and local committees for their splendid assistance, well planned program and entertainment extended this Association during this convention. To the Commercial Club and Alex Johnson Hotel for their coöperation and hospitality. Duly adopted on vote.

E. A. Pittenger, moved that there be a committee appointed to give attention to the basic science bill, such committee to

serve until the next session of the Legislature. Supported by J. C. Shirley. *Motion carried.*

Secretary Cook, presented the necessity of consideration of the annual dues. It was moved by A. S. Rider supported by E. A. Pittenger that the dues be ten dollars for the coming year. *Motion carried.*

Election of Secretary-Treasurer was next in order as the present secretary's term expires. Motion by B. M. Hart that C. E. Sherwood be elected Secretary-Treasurer. *Motion carried.*

Motion by C. E. Sherwood, that D. S. Baughman be elected councilor for Madison District, C. E. Sherwood vacating the office of councilor to accept that of Secretary-Treasurer. *Motion carried.*

Motion by N. K. Hopkins, to elect B. A. Dyar Executive Secretary to the Allied-Council. *Motion carried.*

Motion by S. M. Hohf, that the Council at this time give a rising vote of thanks to J. F. D. Cook, our retiring Secretary-Treasurer, for his many years of efficient and beneficial service to the Medical Association.

There being no further business, it was moved by J. C. Shirley that we adjourn. *Carried.*

J. F. D. Cook,
Secretary-Treasurer.

First Meeting of the House of Delegates, South Dakota State Medical Association May 24, 1937, Rapid City, S. D.

President J. L. Stewart, M.D., presiding. J. F. D. Cook, M.D., Secretary. Meeting called to order at 7:00 p. m. Monday, May 24, 1937, in the ballroom of the Alex Johnson Hotel, Rapid City, South Dakota. Roll call by the secretary; Drs. J. L. Stewart; E. A. Pittenger; J. F. D. Cook; J. R. Westaby; John Calene; J. B. Vaughn; W. D. Farrell; C. E. Sherwood; B. M. Hart; O. A. Kimble; J. C. Shirley; G. E. Burman; E. W. Jones; Wm. R. Ball; R. G. Stevens; L. J. Pankow; S. M. Hohf; H. F. Hansen; F. E. Williams; F. S. Howe; H. R. Kenaston; N. K. Hopkins; P. H. Rozendal; E. H. Grove; P. D. Peabody; F. Pfister; J. D. Whiteside; O. J. Mabee. Quorum present.

J. L. Stewart appointed the following reference committees: Reports of Officers—C. E. Sherwood, J. C. Shirley, W. R. Ball. Resolutions and Memorials—J. B. Vaughn, E. W. Jones, S. M. Hohf. Amendments to Constitution—J. D. Whiteside, B. M. Hart, A. S. Rider. Nominations and Place of Meeting for 1938—J. L. Calene, J. B. Vaughn, C. E. Sherwood, B. M. Hart, G. E. Burman, O. J. Mabee, R. G. Stevens, F. E. Williams, F. S. Howe, H. R. Kenaston, N. K. Hopkins, F. Pfister.

Secretary presented the minutes of the 1936 sessions as printed in the July 1936 issue of THE JOURNAL-LANCET.

Motion by L. J. Pankow and supported by E. W. Jones, that the minutes of the House of Delegates as published in the July 1936 issue of THE JOURNAL-LANCET be approved. *Motion carried.*

Report of membership last report 288, delinquent members paid up 40 making a total membership for 1936 of 328.

For 1937 members paid dues 260. Of this membership 21 new members, majority of new members are recent graduates.

J. R. Westaby presented his report as Delegate to A. M. A. Referred to reference committee on Reports of Officers. (See Report).

Committee on scientific work presented the official program for this meeting as their report.

Committee on public policy. J. L. Stewart presented a verbal report stressing medical influence in the legislature, pointing out the necessity of having representation in the House and Senate of medical men.

Committee on Publication. H. R. Kenaston reported that THE JOURNAL-LANCET was the official publication for this Association.

Committee of Medical Education and Hospitals. No report,

Committee on Medical Defense. No report. (Secretary has material emanating from the Bureau of Legal Medicine A. M. A. May 18th relative to the action of the Committee on Unauthorized Practice of Law of the Committee on Professional Ethics and Grievances, of the American Bar Association, in which it was held that the operation of the medical defense plan of the Ohio State Medical Association constituted the unauthorized practice of law in that State.)

This material came to my hands May 21st, is placed in the hands of T. F. Riggs, chairman of Medical Defense Committee.)

Committee on Medical Economics. W. F. Bushnell presented the committee report. Discussion by E. W. Jones, L. J. Pankow.

Motion that the report be referred to the reference committee. *Motion carried.* (See report reference committee.)

Committee on Public Health. C. E. Sherwood, chairman, presented the report. L. J. Pankow reported on the Minnehaha County plan of venereal disease control which was giving satisfactory results.

Moved by L. J. Pankow supported by P. D. Peabody that the report of C. E. Sherwood be referred to the reference committee. *Carried.* (See report.)

Committee on Necrology. In the absence of the report the secretary read the names of deceased medical men of the state during the past year, a total of twenty-three (23). Eleven of these were members of the State Medical Association as indicated in the list. (See report.)

Committee on Medical Licensure: The report of T. F. Riggs was presented by the secretary, and on motion was referred to the reference committee. (See Report.)

Committee on Radio Broadcast. S. M. Hohf reported no change in the status of this committee. However, he added, "I think the medical profession are lax in missing out in not using that which is available to spread the gospel of clean medical practice." He further urged "a re-establishment of that which we carried out previously through radio-broadcast, and I assure you that I would be glad to serve again as your mouth-piece." The subject of radio-broadcast was further commented on by E. W. Jones.

Committee on Allied Group. N. K. Hopkins, President of the Allied-Council, read his report. On motion report was referred to Committee. (See report.)

Secretary read a communication from the Massachusetts Medical Society inviting our association to send a representative to attend a meeting, during the session of A. M. A. at Atlantic City, New Jersey, to study courses of post-graduate instruction as carried out by the State Medical Associations. Motion by L. J. Pankow, supported by S. M. Hohf, that J. R. Westaby, our Delegate to A. M. A. asked to attend this meeting, that E. A. Pittenger give his co-operation to our delegate. *Carried.*

A communication from G. H. Twining of Mobridge citing the opinion of the Attorney General regarding the use of Dr. Doctor, etc., by Optometrists and Chiropractors. The Attorney General in his community has succeeded in compelling them to delete this from their advertising. N. T. Owen, of the State Board of Health, cited a case of an osteopathic physician using the title "Doctor". Legal advice should be had in such cases.

Secretary Cook introduced R. G. Leland, of the Bureau of Economics of the American Medical Association requesting that he explain the recent communication of Wm. C. Woodward, of the Bureau of Legal Medicine, relating to the attitude and findings of the Committee on Professional Ethics and Grievances and on Unauthorized Practice of Law of the American Bar Association. The Medical Defense Plan of the Ohio State Medical Association being the basis for this report. Dr. Woodward states that:

"It is well to bear in mind that if the analysis of the Ohio plan is correct, then to the extent that the medical association provided and controlled, or assisted in providing and controlling, legal service for a member charged with malpractice, it engaged in practice in the field of law in a way similar to cor-

porate and group practice in the field of medicine, a form of practice condemned by the American Medical Association. (This material is placed in the hands of the Medical Defense Committee for study and report.)

Dr. Leland next discussed the medical economic situation under the present day emergencies. Calling attention to the requirement of listing the diagnosis in reports to the Resettlement Administration, stating that in his opinion this would be contrary to law divulging a privileged communication, that the doctor in making such a report should require the patient to sign a waiver in every case.

He maintained that if "there could be secured a uniform method of medical care of these people who are government wards, I have every confidence in the medical profession that it would respond to the care of these people needing medical assistance in the same way they have always responded—not because they are federal wards, but because they are sick people."

New Business—

C. E. Sherwood presented the matter of a Veterans Hospital for Eastern South Dakota, as sponsored by Rep. Fred Hildebrand who is endeavouring to secure appropriations from the federal government for this purpose. After a discussion of the actual needs of such a hospital, a motion by L. J. Pankow, supported by E. W. Jones, That the question be referred to the Resolutions Committee to prepare a resolution against such appropriation for a Veterans Hospital. A copy of the resolution to be sent to Rep. Fred Hildebrand. *Motion carried.*

S. M. Hohf presented a resolution relative to the status of the Medical School of the University of South Dakota. On motion of S. M. Hohf, supported by L. J. Pankow, to refer the resolution to the committee on resolutions. *Motion carried.* (See reference Committee report.)

Secretary Cook reported on the Spafford Memorial Scholarship; 1935. Not awarded. 1936, Louise Breckerbaumer, Sioux City, Iowa. As reported from President I. D. Weeks.

S. M. Hohf proposed the name of C. M. Keeling, M.D., of Springfield as honorary member of Yankton District Medical Society.

Secretary Cook, All honorary members of the district medical societies, according to the By-Laws are to be elected by the district Society and presented to the House of Delegates for approval.

E. A. Pittenger, suggested that the next meeting be held on Sunday, so that a day would not be lost from members' practice. This suggestion to be acted upon later. Motion by W. R. Ball to adjourn. *Motion carried.*

J. F. D. Cook, Secretary

HOUSE OF DELEGATES SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Second Meeting

Rapid City, S. D., May 25, 1937

President J. L. Stewart, Presiding.

Meeting called to order by the chair.

Roll call as follows: J. L. Stewart; E. A. Pittenger; J. F. D. Cook; J. D. Whiteside; J. B. Vaughn; B. M. Hart; G. E. Burman; O. J. Mabey; E. W. Jones; Wm. R. Ball; N. J. Nessa; R. G. Stevens; C. E. Sherwood; L. J. Pankow; S. M. Hohf; H. F. Hansen; F. E. Williams; F. S. Howe; H. R. Kenaston; N. K. Hopkins; P. H. Rozendal; E. H. Grove; P. D. Peabody; F. Pfister. Quorum present.

Reading minutes of the meeting held Monday evening May 24th, was in order. Motion by L. J. Pankow and duly supported that the reading of the minutes be dispensed with. *Motion carried.*

REFERENCE COMMITTEE REPORTS

C. E. Sherwood, Chairman submits the following report of his committee; That the report of J. R. Westaby, Delegate to the American Medical Association 1936 Sessions, is hereby approved.

That the report of Sub-Committee on Medical Licensure, as presented by T. F. Riggs, chairman, is hereby approved.

That the report of the Public Health Committee as presented by C. E. Sherwood, Chairman is hereby approved.

That the report of J. F. D. Cook, Secretary-Treasurer, is hereby approved.

That the report of the Council as given verbally by J. L. Stewart, be approved.

That the report of Committee on Scientific program, Secretary reports the printed program as our report. Is hereby approved.

That the report of the Committee on Medical Economics. The Committee begs to report as follows: "We are of the opinion that the report indicates much thought and work on the part of the Committee, and much merit is contained therein. We refer the same to the House of Delegates for your consideration."

Motion by Wm. R. Ball that the report of the reference committee be approved as presented. *Motion carried.*
(See reports.)

REPORT OF REFERENCE COMMITTEE ON RESOLUTIONS AND MEMORIALS

The matter of building a Veterans Hospital for eastern South Dakota as sponsored by Representative Fred Hildebrand of Watertown, S. D., Your Committee begs to report as follows;

Whereas: Representative Fred Hildebrand of Watertown, S. D. is sponsoring and working for the establishment of a \$450,000.00 hospital for Eastern South Dakota:

We, the South Dakota Medical Association, in convention assembled do protest the establishment of this Hospital and the further building of Hospital facilities by the Veterans Administration for the following reasons:

"FIRST: We believe that there are ample Hospital facilities for the care of all service-connected disabilities.

"SECOND: There are ample fully accredited hospital beds and facilities for care of all non-service connected disabilities in the private and public hospitals of the State.

"THIRD: These non-service connected disabilities can be taken care of more satisfactorily to the Veteran at home.

"FOURTH: These non-service connected disabilities can be taken care of in existing private and public hospitals with less expense to the Administration.

"FIFTH: The building of further hospitals for the care of non-service connected disabilities at public expense constitutes direct governmental competition and unnecessarily adds to the tax-payer's load.

"THEREFORE: We, the South Dakota State Medical Association respectfully protest the appropriation of monies for the further building of Veterans Hospitals."

Motion by C. E. Sherwood that the above committee report on Hospitals be approved. That the Secretary send copies of the resolution to members of Congress from South Dakota. *Motion carried.*

S. M. Hohf presented the following resolution to the Council on Medical Education and Hospitals of the American Medical Association:

Whereas: The State of South Dakota, through its legislative body, has recently manifested an earnest desire to adequately support and perpetuate the School of Medicine of the University of South Dakota, and

Whereas: the sum appropriated by the legislature is sufficient to meet the immediate needs of the School through the addition of teaching personnel, increased library facilities and needed equipment, and

Whereas: the organized medical profession of the State, as no other group, realizing the need of such a school in South Dakota, has always taken great interest in its welfare and has felt pride in its accomplishments as manifested by the records of its students, and

Whereas: it has been brought to our attention that the School's authorities sense difficulty in procuring the right kind of instructors for the School and enrolling students for the school years of 1937-38 and 1938-39 if the present status of

the School is not bettered by immediate action by the Council on Medical Education and Hospitals,

BE IT RESOLVED THEREFORE: That the House of Delegates of the South Dakota State Medical Association, in annual meeting assembled, does hereby respectfully urge the Council on Medical Education and Hospitals of the American Medical Association to take immediate steps which will permit provisional enrollment of students and to take such other action as will not unduly handicap the School of Medicine of the University of South Dakota in its earnest endeavor to meet the requirements imposed by your Council and allied agencies.

Signed, Committee

S. M. HOHF, M.D., Yankton, S. D.

E. W. JONES, M. D., Mitchell, S. D.

J. B. VAUGHN, M.D., Castlewood, S. D.

Dated Rapid City, S. D., May 24th, 1937.

On motion of S. M. Hohf, supported by E. A. Pittenger, That the above resolution be approved. *Motion carried.*

COMMITTEE ON NECROLOGY

"In submitting a list of members of our Association who have passed on during the year, your committee feels that it is befitting to pause a moment in the deliberations of this meeting in memory of those who have been with us in the past, some of whom have served in an official capacity. *Roll Call follows.*

J. B. VAUGHN, for the Committee

DECEASED—1936-37

MICHAEL E. EGAN, M.D., Sioux Falls.

Died April, 1936. Aged 74.

Hamline University Medical School, St. Paul, Minn.

JOHN SUTHERLAND, M.D., Britton.

Died May 28, 1936. Aged 79.

Rush Medical College, Chicago, Ill.

WILLIAM MOODY HUNT, M.D., Murdo.

Died June 18, 1936. Aged 71.

Cleveland Medical College, Cleveland, Ohio.

*CARL GILBERT LUNDQUIST, M.D., Leola

Died June 26, 1936. Aged 53.

Rush Medical College, Chicago, Ill.

ALBERT LUKE STUBBS, M.D., Hot Springs.

Died June, 1936. Aged 71.

Keokuk College of Physicians & Surgeons, Keokuk, Iowa.

*OTTO HENRY GERDES, M.D., Eureka.

Died June 29, 1936. Aged 68.

Rush Medical College, Chicago, Ill.

H. P. HANSON, M.D., Beresford.

Died June, 1936. Aged 90.

Creighton University School of Medicine, Omaha, Neb.

*E. W. GOLDMAN, M.D., Madison

Died August 8, 1936. Aged 56.

Creighton University School of Medicine, Omaha, Neb.

*BENJAMIN THOMAS, M.D., Huron.

Died August 19, 1936. Aged 70.

University of Illinois College of Medicine, Chicago, Ill.

*ANDREW PAULSON, M.D., Watertown

Died September 16, 1936. Aged 63.

Jefferson Medical College of Philadelphia, Pa.

*PHILIP R. BURKLAND, M.D., Vermillion.

Died September 30, 1936. Aged 61.

Northwestern University Medical School, Chicago, Ill.

SARKIS K. MERDANIAN, M.D., Oelrichs.

Died November 7, 1936. Aged 72.

Missouri Medical College, St. Louis, Mo.

*MONTE A. STERN, M.D., Sioux Falls.

Died November 7, 1936. Aged 51.

Creighton University School of Medicine, Omaha, Neb.

E. O. CHURCH, M.D., Menno.

Died December 3, 1936. Aged 64.

University of Illinois College of Medicine, Chicago, Ill.

LARS J. HAUGE, M.D., Howard.

Died November 20, 1936. Aged 76.

Sioux City College of Medicine, Sioux City, Iowa.

DECEASED—1937

- *E. C. SMITH, M.D., Mission, S. D.
Died January 20, 1937. Aged 77.
Not listed in directory.
- J. L. MILLER, M.D., Spencer.
Died January 6, 1937. Aged 62.
Drake University College of Medicine, Des Moines, Iowa.
- *CARL A. FEIGE, M.D., Canova.
Died January 26, 1937. Aged 59.
Hahnemann Medical College, Chicago, Ill.
- *C. WM. FORSBERG, M.D., Minneapolis, Minn.
Sioux Falls Dist. Med. Soc.
Died February 21, 1937. Aged 40.
University of Minnesota Medical School.
- *RAMEY M. BAKER, M.D., Sturgis.
Died March 1, 1937. Aged 30.
University of Nebraska College of Medicine, Omaha, Neb.
- L. M. HARDIN, M.D., Flandreau.
Died March 19, 1937. Aged 68.
Marion Sims College of Medicine, St. Louis, Mo.
- FRIEDE VAN DALSEM, Huron.
Died 1937. Aged 92.
(Non-graduate; licensed in 1887.)
- J. D. FREED, Goodwin.
Died March 27, 1937. Aged 85.
New York Homeopathic Medical College.
- *Deceased member of State Medical Association.

COMMITTEE ON NECROLOGY

To The South Dakota State Medical Association:
Rapid City, S. Dak.

The committee on necrology wishes to make the following report of the doctors that passed away in the state during the last twelve months.

Dr. Michael E. Egan, aged 74 years, of Sioux Falls, S. D., died at a Chicago hospital recently after a short illness. Dr. Egan was a graduate of Hamline University.

Dr. John Sutherland, aged 79 years, who has been in active practice for many years at Britton, S. D., passed away on May 28. Dr. Sutherland held degrees from several European universities, and has contributed many valuable papers that have been published in *THE JOURNAL-LANCET*.

Dr. William Moody Hunt, of Murdo, S. D., a graduate of Cleveland Medical College, Cleveland, Ohio, died June 18, 1936, at the age of 71 years.

*Physicians of South Dakota and the Northwest were bitterly grieved to learn of the death of C. Gilbert Lundquist of Leola, South Dakota, who died at Saint Luke's Hospital in Aberdeen at 7:30 A. M. on June 26, 1936, as the result of an automobile accident on June 26, suffered in the course of his practice. Dr. Lundquist was born on October 14, 1883, in Pembroke Township, Edmunds County, in what was then Dakota Territory. He was the second white child born in the Territory.

Dr. Jessie E. Stubbs, one of the well known physicians of Hot Springs, S. D., passed away last month after an illness of several months. She was always very active in religious, social and civic matters, and will be sadly missed in that city.

*Dr. O. H. Gerdes, who has been in active practice at Eureka, S. D., for over 43 years, died at his home on July 29, at the age of 68 years, after an illness of many months. Dr. Gerdes was a graduate of Rush Medical College in the class of 1892.

Dr. H. P. Hanson, Beresford, one of the pioneer physicians of South Dakota, passed away last month at the advanced age of 90 years. Dr. Hanson had always taken an active part in church and all community activities.

*E. W. Goldman, M. D., Madison, S. D., graduate of Creighton University School of Medicine, Omaha, Nebr., died August 8, 1936, at the age of 56.

*Dr. Benjamin Thomas, Huron, S. D. was suddenly called by death on August 19th. The doctor had been in practice in Huron for over 30 years.

*Dr. Andrew Paulson of Watertown, S. Dak. died Septem-

ber 16, 1937, after a long illness, the result of an automobile accident some years past.

*Dr. Philip R. Burkland, one of the pioneer physicians of Vermillion, S. D., died suddenly at his home in that city September 30, 1936.

Sarkis K. Merdanian, M. D., Oelrichs, graduate of Missouri Medical College of St. Louis, Mo., died November 7, 1936, aged 72.

*A sudden heart attack while he was attending to professional duties at his office caused the death of Dr. Monte A. Stern, 51 years old, prominent Sioux Falls physician and surgeon. Dr. Stern had lived since childhood, and practiced medicine in Sioux Falls for nearly a quarter-century. He was at his office attending to a patient when the fatal attack occurred. His death came as a distinct shock.

Dr. E. O. Church, Menno, South Dakota, died suddenly on December 3, 1936, of a heart attack. He was a graduate of the University of Illinois College of Medicine in 1900. Dr. Church had practiced medicine in Revillo, South Dakota, for 24 years, and in Menno for 4 years.

Dr. Lars J. Hauge, for the past 32 years a physician of Howard, S. D., died at the age of 76 in Howard, November 20, 1936. Dr. Hauge was a graduate of the old Sioux City (Iowa) College of Medicine; but prior to that had been a minister in the Norwegian Lutheran Church.

*Dr. E. C. Smith, 77, passed away on January 20, 1937, at Winner, South Dakota. Doctor Smith, a pioneer physician of South Dakota, was president of the Rosebud District Medical Society, and health officer for Todd County at the time of his death. He was a member of the South Dakota State Medical Association and of the Sioux Valley Medical Association. He was in practice at Mission, S. Dak.

J. L. Miller, M.D., Spencer, graduate of Drake University College of Medicine, Des Moines, Iowa, died January 6, 1937.

*Dr. Carl A. Feige, 58, died January 26 after an illness of two months. Spending the early days of his practice in Kansas City, Dr. Feige came to South Dakota in 1924. After being in Iroquois and Huron, he settled in Canova in 1928. Dr. Feige was appointed a member of the State Board of Medical Examiners by Governor Green, and was re-appointed to the post by Governor Berry. Of a very public-spirited nature, Dr. Feige took great interest in the community affairs. As a member of the town council and mayor for several years, he helped in the building of the town park. He was a Master Mason, a member of the Consistory, and a Shriner.

*Carl William Forsberg, M.D., Ph.D., instructor in pathology at the University of Minnesota Medical School, died on Feb. 21, 1937 in University Hospital. His degree was obtained from the University in 1922; but he was a member of the South Dakota State Medical Association. He practiced in Sioux Falls from 1927 to 1933.

*Dr. Ramey M. Baker, 30, of Sturgis, South Dakota, died at St. John's Hospital in Rapid City on March 2, 1937. Dr. Baker was graduated from the University of Nebraska College of Medicine in 1931, coming to Sturgis in 1933.

Dr. L. M. Hardin, Flandreau, S. D., a graduate of Marion Sims College of Medicine, St. Louis, Mo., died March 19, 1937 at the age of 68.

Dr. Friede Van Dalsem, 92, pioneer physician of Beadle County, South Dakota, died in Huron during March. She is survived by four children and one sister.

Dr. J. D. Freed of Goodwin, S. Dak., died in the Luther Hospital, Watertown, S. Dak., March 27, 1937, at the age of 85 years, 5 months. Dr. Freed had been in poor health for some time previous to his death. He had been in active practice for about 55 years, most of the time in Goodwin, S. Dak. Dr. Freed will be missed very much by his friends in and around Goodwin. Mrs. Freed preceded the doctor in death three years ago. They had no children.

*Deceased member State Medical Association.

Respectfully submitted,

Dr. M. J. HAMMOND,
Dr. J. B. VAUGHN,
Dr. W. H. SEXTON.

Report of Committee on Nominations and Place of Meeting for 1938

Chairman, J. L. Calene to make the following report; nominations for President Elect; J. F. D. Cook; T. F. Riggs; Vice President; J. C. Shirley; J. C. Ohlmacher. Councilors: No. 9, R. B. Fleeger; No. 10, H. R. Kenaston; No. 11, N. K. Hopkins; No. 12, Wm. Duncan.

Place of meeting for 1938 Huron, S. D. We recommend that no group meeting be held with other societies next year.

The committee report accepted and proceeded to vote by ballot. Chair appointed B. M. Hart, P. D. Peabody and J. R. Westaby as tellers. Vote for President Elect was had, tellers report a unanimous vote cast for J. F. D. Cook, who was declared elected as President-Elect.

Election of Vice-President. A vote was prepared and the tellers report as follows; J. C. Shirley 15. J. C. Ohlmacher 7. Motion by E. W. Jones supported by L. J. Pankow that J. C. Shirley be declared unanimously elected Vice-President. Motion carried. J. C. Shirley declared elected.

Motion by C. E. Sherwood stated in view of the fact that the nominees were not opposed in their respective districts, the rules be suspended and the nominees be declared elected. As a motion this was supported by J. F. D. Cook. Motion carried. The Secretary cast the unanimous vote of the House for the nominees who were declared elected.

The Committee report on place of meeting and the invitation of the Huron Commercial Club be accepted, and the Association meet in Huron, S. D. in 1938.

That no group meeting be held with other societies next year.

This motion by C. E. Sherwood, supported by L. J. Pankow. Motion carried.

President, J. L. Stewart reported that an oral request from a dentist asking support of the House of Delegates in placing a dentist on the State Board of Health. No action was taken and further details of the proposition asked for.

Communication from Elvira Nelson, secretary of the South Dakota Nurses Association regarding the support of the State Medical Association in an effort to procure legislation to require registration of all available nursing service—registered nurses, undergraduates and practical. Motion by E. A. Pittenger, supported by E. W. Jones that this be referred to the committee on legislation at their next meeting. Motion carried.

Motion by N. K. Hopkins, that G. E. Burman be elected as councilor for District No. 5 from which office J. C. Shirley automatically vacates by his election as Vice-President. Motion carried.

Motion by E. A. Pittenger that the House of Delegates begin their meeting on Sunday next year. A standing vote was called for by the chair. Motion lost. N. K. Hopkins called attention to the condition of his district because of removals, it was decided by the district to surrender its charter and the members join with the Madison District. Secretary asked for a resolution from the officers of the Kingsbury District Society for a matter of record.

District boundaries should be a matter of consideration by the council. Motion by B. M. Hart to adjourn. Motion carried.

J. F. D. Cook, M.D., Secretary-Treas.

The Committee on Public Health Submits the Following Report

The Committee on Public Health has been fairly active during the past year. We pursued the policy adopted two years ago that all matters pertaining to Public Health be consolidated and referred to this committee.

In September of last year the American Society for the Control of Cancer started organization of this state for the enlistment of the Women's Field Army. Your committee was contacted by Dr. Flude, the field representative, when he was here in the fall. Mrs. Howard E. Trask, of Pierre, was appointed as State Commander with our approval in October. The executive committee is made up of Doctors C. E. Sherwood (chairman), D. S. Baughman, W. R. Ball and B. A. Dyar. While the organization went slowly the enlistment met

with fair success and we are sure more progress will be made next year. The executive committee was also instrumental in securing the services of Mr. John Barton, of Sioux Falls, as state treasurer.

In the fall, Surgeon General Parran, of the United States Public Health Service, requested that a special committee on control of Syphilis be appointed from the State Medical Society. In accordance with our policy this matter was referred to your committee on Public Health. A special sub-committee, to act in this matter, was appointed with the chairman of your committee as chairman and Doctors R. G. Mayer and Anton Hyden members. The following is a copy of their recommendations to Surgeon General Parran.

"In reply to your letter of March 20th, relative to recommendations of our committee for control of Syphilis which will be practical of application within our state we offer the following.

First, due to the largely rural character of our population we feel that the establishment of special venereal disease clinics would not be practical in South Dakota except in two or three instances. It is probable that Sioux Falls and Aberdeen are large enough centers so that the establishment of clinics might be an important factor in control. Rapid City might possibly be included also.

Second, through our State Board of Health we are already furnishing medicine for the treatment of Syphilis, which can be had upon application, to the Health Officer, by any physician treating such cases. Our state Health Laboratory furnishes to all physicians mailing outfits for the collection of blood for sero-diagnosis, which is done free of charge to the physician.

Third, dark field diagnosis should be made more readily available, at least in every hospital in the state.

Fourth, funds should be made available to partially recompense physicians for the treatment of indigent syphilitics.

Fifth, for the present, at least, we feel that the program of Syphilis eradication should be largely educational on two fronts, (a) to the physicians, through talks at Medical Society and special meetings and possibly into the office of the individual physician stressing the points of diagnosis and treatment, (b) education of the public through newspaper articles, radio talks, and public speakers much on the order of the popular propaganda put out by the Tuberculosis and Cancer Organizations leading to the education of the public in early consultation of their family physician for diagnosis and treatment."

Several members of your committee have been appointed to the advisory council of the South Dakota Public Health Association and have met and advised this association on their policies. It is our opinion that this association is doing a good piece of work in Tuberculosis control and that it should have the whole hearted coöperation and support of the physicians of the state.

Federal funds are still being made available for child and maternal welfare work as well as for assisting crippled children.

Health conditions generally throughout the state are about average. An epidemic of Cerebrospinal Meningitis in the Hills area being promptly brought under control.

Influenza reached epidemic proportions during the early months of the year.

Dr. J. V. Sherwood, Superintendent at Sanator, called attention to the fact that recent legislation gives the Sanatorium the right to discharge patients not being benefited by sanatorium treatment after six months of residency. This law, of course, was passed to facilitate taking care of incipient and moderately advanced cases of Tuberculosis who have some chance to get well. This then will discharge from the Sanatorium old chronic cases which have not been benefited by sanatorium treatment. Perhaps for a time this will increase the public health problem in taking care of these open cases that are not in the Sanatorium. He is of the opinion that steps should be taken for the establishment of a farm or some such place for the care of these chronic open cases. He further advises the establishment of a contact program, that is, a follow-up program in an effort to run down contacts both in re-

actors as discovered by tuberculin tests of school children and in active cases discovered.

Your committee wishes to report the whole hearted coöperation of the State Board of Health with the Society in all matters dealing with the Public Health.

Respectfully submitted,

CLARENCE E. SHERWOOD, M.D., *Chairman*

REPORT OF ECONOMICS COMMITTEE

It is with marked sadness we here are reminded of the loss of a fellow member of this committee.

The sudden death of Dr. M. A. Stern, in November, removed from our gatherings one keenly interested in the problems concerning this particular committee, and one generally respected for his devotion to the highest ideals and traditions of the medical profession.

Paradoxical as it is—with the economics of the profession so upset in readjustment—this report shall be brief.

To go back to the 1934 meeting in Mitchell, be reminded that the personnel of this committee was purposely chosen because of criticism and debate in the meeting of the Delegates, and concerned or opposed principally:

1. The stereotyped committee reports which were customarily read year after year, with no real committee work ever being done.

2. The lack of coöperation and coördination between the State Medical Association and the State Board of Health, as well as the other Allied Groups.

3. The lack of executive authority on the part of the officers of the Association.

These committee members, fully cognizant of these reasons for their appointment, therefore had naught to do but to accept and serve with a determination to prove their justification. This took considerable time and effort in study and travel, to bring in the report for the 1935 meeting in Pierre; which report was unanimously adopted and approved and which in the main:

1. Announced an established relationship with the State Board of Health.

2. Provided for a full time Executive-secretary to work along with the Elective-secretary of the state Association, which was made possible solely because of the relationship established with the State Board of Health.

3. Promoted direct coöperation and coördination of all Health Agencies and Health Programs in the state.

4. Instituted a Speaker's Bureau.

5. Established an Educational Bureau.

6. Advocated complete divorcement of politics in all health matters, requiring instead, qualifications and society endorsement.

7. Urged an immediate increase in membership in the State Medical Association.

8. Suggested the formation of a working unit with the Allied Medical Groups of the state, *i. e.*, Dentists, Nurses, Druggists, Hospitals and Veterinarians.

For the 1936 meeting, the committee devoted most of its effort to the development of a mutual understanding and conduct between the Allied Medical Groups in things professional and politic; and succeeded in affecting a combined meeting in Sioux Falls in 1936, for the purpose of demonstrating potential strength and the formation of a positive organization. This was accomplished to the complete satisfaction of this committee, which left little more to report except to present a review of what had already been recommended and accepted.

NOW IS 1937—and the final report of this committee. As stated in the opening paragraph, it shall be brief in order to be true to our convictions that are even more pronounced now than in 1934, regarding professional unity and Association conduct. A detailed report and recommendations would be easy to prepare, but it is fulfillment of those already accepted, that shall advance our Association. We shall therefore, at this time, respectfully request enforcement of previous approved recom-

mendations of this committee in the firm belief that if this be done with this, and all committee reports, the South Dakota State Medical Association shall progress, the profession shall maintain its right and dignity in its social and economic relationship to the betterment of the individual physician and the greater satisfaction of the public.

At this time, this committee would like to restate and specifically emphasize:

I. COMMITTEE RECOGNITION AND FUNCTION.

Each committee should be responsible throughout the year, and receive all respective material for study and recommendation back to the Council or Executives. To illustrate—this Committee, during its tenure, has never had referred to it matters affecting the economics of the Association. Maybe we are wrong, but we feel that if the Rehabilitation Medical Relief had been thus opinionated, it might have been more easily and satisfactorily handled. Not in any way as a criticism, but simply as a fact, this Rehabilitation Relief problem not only deprived the membership of all the Medical Groups any pecuniary aid, but went a long way in breaking down trust and confidence in our own Association and in the Inter-Allied Council. It is to be regretted that it proved so unpleasant for all concerned, particularly the Council and Executive Officers. In this connection, our Council is unwieldy and more or less uninformed. The personnel is scattered—meetings require personal sacrifice and are hurried. Instead, some State Associations are setting up Executive Boards of five or seven members which this Committee believes practical and efficient and worthy of consideration.

- II. It is recommended that more real authority be delegated to the Association executives and that they be upheld by the membership.

- III. It is urged that the State Medical Association formulate, without delay, a Basic Science Law, and through the Inter-Allied Council, prepare at once for its enactment.

- IV. Our urgent plea is that this Association bend all effort to the fulfillment of the opportunities of the Inter-Allied Council. This, we regard as our prime accomplishment. The Executive-secretary of the State Medical Association serves also as Secretary of the Inter-Allied Council—which is an ideal arrangement because of his association with, and the attitude of the State Board of Health. Compensation should be afforded him by the Inter-Allied Council that he could have a full-time job, and the State Medical Association should see to this provision.

- V. It is a foregone conclusion that finances must be had if we are to progress. We recommend the establishment of an Educational Fund, to be built up to an appreciable amount before being used not only for the education of the membership, but for the enlightenment of the public and the protection and improvement of our economic and professional welfare. The ways and means of this fund should receive immediate attention and a few suggestions might be through dues, assessments, an individual percentage of fees from Resettlement work, bequests, *etc.*

- VI. We urge again that the Association take steps to stop the nefarious practice of all groups, private and civic, when soliciting charity funds, of stressing first that the money is needed for medical services. It never is as the people are so led to believe. State-wide action should be directed against this, and the public not further misinformed. It might also be advocated that physicians' services in all instances be credited as donations, and in lieu thereof.

- VII. This Committee wishes to express a word of commendation to the Radio Committee for its untiring effort. If it be re-established, might we suggest the consideration of a circus or entertainment feature, only just touching on medical topics in the announcements.

In closing, we wish the membership to know that we have been afforded a most enjoyable and profitable three years and are grateful for our many pleasant contacts and associations. We are grateful to our fellow officers for their many courtesies, and we would be remiss if we did not mention our personal appreciation for the trust and confidence and many kind favors,

extended to us from the beginning by Dr. Jenkins and his associates in the State Board of Health. Out of this came the office created for Dr. Dyar, who has endeavored at all times to fulfill his trust, and has been of immeasurable assistance in the lightening of what would have been an impossible task for our long-time secretary, Dr. J. F. D. Cook.

WE ARE MORE CONVINCED THAN EVER THAT, "THE ETHICS AND IDEALS OF THE MEDICAL PROFESSION" MEAN MORE TO "THE BROTHERHOOD OF MAN" AND "THE GLORY OF OUR CREATOR," THAN THOSE OF ANY GROUP ON EARTH, AND WHAT A PITY WHEN THEY BE DESECRATED!

WILL E. DONAHOE, M.D., *Chairman*
WM. F. BUSHNELL, M.D.

May, 1937

REPORT OF DR. J. R. WESTABY
DELEGATE
A. M. A.
SOUTH DAKOTA STATE MEDICAL
ASSOCIATION
HOUSE OF DELEGATES

Gentlemen:

It is my pleasure at this time to report to you some of the proceedings of the American Medical Association whose House of Delegates convened on May 11th in Kansas City in the Ballroom of the Muehlebach Hotel at 10 A. M.

The Speaker of the House, Dr. N. B. Van Etten called the meeting to order and the Reference Committee on credentials reported that 153 delegates were properly registered and vouched for.

Dr. Van Etten charged all delegates with the seriousness of the work before them, and asked for courageous and diligent consideration of all work presented in the interest of whatever is best for American Medicine and the American People.

Tribute was paid as usual to the past members of the House of Delegates answering the final call since the Atlantic City Meeting and the Speaker summed up the Memorial Address with these words: These our friends, have passed beyond our vision, but they will continue to live in our memory.

*Time like an ever rolling stream
Bears all its sons away
They fly forgotten, as a dream
Dies at the opening day,
Our God our help in ages past,
Our hope for years to come
Be thou our guard while life shall last,
And our Eternal home.*

President James S. McLester was next introduced and spoke at quite some length regarding the conditions affecting the American Physician during these times of depression and expressed satisfaction in the loyalty of the profession in general for maintaining high ideals, scientific attainments and professional usefulness.

Dr. McLester pled earnestly for the profession to avoid State Medicine and Socialized Medicine under whatever disguise they attempted to appear, and called attention to the provision of the Social Security Act, recently enacted by Congress by which politicians in the near future will carry governmental subsidies to include medical care in an attempt to ensnare the public and physician into adopting unsound principles in the care of the sick. The attitude of the American Medical Association as in the past should be one of close attention to the medical needs of the American people and of alert preparedness to meet those needs.

President McLester spoke the thoughts in the minds of all those present when he called attention to our great regret over the illness of our friend and President Elect, Tate Mason.

Dr. B. T. King of Washington read Dr. Mason's message

in which he analyzed his visiting tour about the United States before being compelled to give up with an attack of influenza.

Dr. Mason said he found the physicians of the United States divided into three groups.

1. Those who felt that the A. M. A. should have and needed more leadership; that the House of Delegates should meet twice a year; that the A. M. A. should spend much more to educate the public, by radio, newspaper, and platform so that misconception and false impressions might not gain a foothold regarding the practice of medicine.

2. In this group were physicians who wished a change in the delivery of medical care to the public. They approved the small Health Units of Service similar to those now established over limited geographical areas such as have appeared in South Dakota.

3. A third and by far the largest group of physicians felt that the House of Delegates should recognize the medical situation existing at this time and give special attention to the financial aspects of the practice of medicine.

It is not surprising that the stringency, in its acute phase, made medical economics a matter of primary concern among physicians and the public itself. Some of the plans being proposed to remedy this situation have originated within and some without the medical profession. Some of the propositions show careful thought and have received great support in the hope that their application might improve the economic situation for both the public and the physician. Many other schemes show very little constructive thinking and consequently are offered as a cure-all for all the economic ills of all concerned.

The House of Delegates feel that no plan should be encouraged unless its aim is to preserve the individual practice of medicine, with unhampered and open competition among physicians and the continuance of personal relationship of doctor and patient. It is the opinion of leaders of medical thought today that once the above principle is compromised, the medical profession of our country is headed toward political corruption and serfdom.

We of course knew the hopeless condition of our president-elect, confined in his own hospital in Seattle, and his death a short time after the convention was expected, although everyone hoped that he might be the exception to the rule and that he might recover. The majority of the Delegates felt that he should have the honor of being installed, and so at the general scientific assembly meeting he was made President of the A. M. A. with Dr. B. T. King acting as his proxy, while Dr. Mason listened to the ceremony by radio.

At the business session on Tuesday the Committee on Medical Education recommended the adoption of a resolution making the requirements for entrance into all ranking medical colleges uniform and prescribing the courses of those requirements.

The Committee on Legislation and Public Relations urged the medical profession to co-operate in good faith in carrying out the provisions of the "Social Security Act" since it is now a Federal Statute. This Committee also pointed out that the creation of multiple non-medical agencies is not desirable or acceptable to the medical profession. We should insist that these studies be made by medical men under medical supervision. The Committee also recommends that since medical men must now report to the local police the care of all gunshot wounds, the same requirement be imposed on everyone having knowledge of the wound and the possible condition under which it was inflicted. The Committee also condemned the practice of performing operations designed to alter the appearance so as to conceal the identity of an individual.

A large number of the resolutions and recommendations of committees were very lengthy and required several pages of explanation and required much discussion and I feel that it is not necessary to burden you with a prolonged report at this time.

The Secretary reported that the increase in membership had exceeded that of all previous records by 2,000 and that the

tendency was showing greater interest in the affairs of the Association. Dr. Olin West also commended the State Secretaries for the good work they were doing and praised the Annual Conference of Secretaries and the field work of the Association.

On Thursday afternoon the following officers of the Association were elected for the coming year:

President-Elect for 1938-39—Dr. J. H. J. Upham of Columbus, Ohio.

Vice-President—Dr. Chas. Gordon Heyd of New York (became president, 1936-1937 on death of President Mason).

Secretary—Dr. Olin West of Chicago, Illinois.

Treasurer—Dr. Herman L. Kretschmer of Chicago, Illinois.

Speaker of the House of Delegates—Dr. N. B. Van Etten of New York.

Vice Speaker of the House of Delegates—Dr. H. H. Shoulders of Tennessee.

The place of meeting for 1937 was discussed and invitations were formally extended from Philadelphia, Pa., and Atlantic City, N. J. The vote stood Philadelphia 69, Atlantic City 70.

Report of Subcommittee on Medical Licensure to the Officers of the South Dakota State Medical Association

GENTLEMEN:

In accordance with communication under date of March 31st, 1937, coming from the Secretary of The South Dakota State Medical Association, we beg leave to make the following report:

1. In accordance with instructions received from the Councilors and Officers of the Association, we prepared a bill providing for a special Board of Medical Examiners separate from the Board of Health, one idea being, as we understood it, that by this means the fees of the applicants to practice could be turned over to the treasurer of the State Medical Association. Following the preparation of the bill we were made aware that licenses to practitioners in medicine are granted by the State of South Dakota and not by the State Medical Association, consequently, the fees obtained from the applicants would of necessity revert to the Treasurer of the State of South Dakota. This made the inadvisability of such a bill self-evident.

2. In accordance with instructions, we prepared a bill requiring the annual registration of all practitioners of the healing arts. We were informed and had reason to believe that the groups known as osteopaths and chiropractors would join us in attempting to pass this bill providing the fees obtained from each of these groups should go to its respective treasurer. This bill was submitted to the Council and so many criticisms and additions were received that it was evident there would be no possibility of getting the bill through. Details can be furnished on request.

3. The matter of Senate Bill 205, while not coming directly under the field of activity of the special committee, yet related in a way to licensure. This bill related to the qualifications of applicants for examination before any state board for a license to practice the healing arts and carried with it the appointment of an examining board consisting of the Superintendent of Public Instruction, the President of the State University, and the President of the South Dakota State College. In reality it was a Basic Science Law and would have worked out well could it have been put across. It was introduced through the State Affairs Committee but was not reported out of the Committee owing to the fact that no details were carried in the bill relative to the types of examinations which the examining board was to carry out.

Respectfully submitted,

T. F. RIGGS, M.D.

B. A. DYAR, M.D.

JOHN C. SHIRLEY, M.D.

PRESIDENT'S ADDRESS

J. L. Stewart, M.D.

Nemo, South Dakota

Delivered at Rapid City, South Dakota
May 25, 1937

AS PRESIDENT of this Association it becomes my privilege to deliver the Annual Address, and I will begin by thanking the members for electing me to this office. It is the greatest honor within the gift of the greatest and most beneficent organization in the State.

Tonight as I stand on the high hill of advancing years and look back over the days that are gone, and over the tremendous advances that medicine has made during the last fifty years, I wonder how many of the younger doctors present realize what an honor it is to belong to the noblest profession under the sun, and to the association that is representative of that profession.

You know, of course, that in recent years we have nearly stamped out several preventable diseases, but do you realize (as do the older men) what these diseases really meant?

The death-dealing epidemics of typhoid fever, scarlet fever, diphtheria, and summer complaint in babies were real tragedies to the doctors of former years.

You can all recall the typhoid epidemic at Chamberlain a few years ago, and what excitement it caused. Now, think that forty or fifty years ago most any doctor in the State had that many cases every year. During that period Sioux Falls had over 300 cases in one year. Imagine a country doctor hitching up his team and driving out to see four, six, eight, or even ten cases of typhoid fever in one day and you will have a picture of early day conditions. Typhoid fever was almost constantly with us in those days.

Those of us who represent a fast vanishing generation, and have lived through this period of advancement, probably realize more fully than others the great change. Not only do people live longer, but I am sure that there is less pain and suffering today than there was years ago.

Why all this advance in life saving and in pain relieving? The answer can be given in two words; organization and co-operation. The doctor of years ago worked independently. True, he consulted the ethical men in his neighborhood and took post graduate work, but in the main he worked as an individual.

A little over fifty years ago the profession began to organize. Gradually the spirit of organization spread until to-day we have the American Medical Association, the State and District Societies, and they are all working together harmoniously trying to relieve suffering and save life.

About this time we began to have specialists to whom doctors could send their most difficult cases. This further helped in saving life. Not that the specialist was any better doctor than the general practitioner, but because he limited his work to one line of practice, he became more proficient in that line.

Then came the clinic or group of specialists, that still further added to our ability to save life. The Mayo Clinic at Rochester pioneered in this kind of service and the good that they have done would be hard to estimate.

As our profession became more and more organized, doctors realized that they must have the authority of law back of them if they were going to accomplish very much in their life-saving program.

Then began the struggle to establish State and County Boards of Health. These Boards had little authority at first but it was a beginning.

Then came the greater struggle to pass a law establishing a Board of Medical Examiners. That law was opposed by all patent medicine companies and all irregular practitioners, but after several sessions of the legislature it was passed.

Later came the laboratory that has aided so much in diagnosis, and we must not forget the trained nurse, the dentist, the druggist, the veterinarian and the hospital. To-day all these agencies are working with us to help us to heal the sick.

We have in this State an organization that takes in all of these allied professions, and, if I have been correctly informed, it is the only such organization in the United States. We expect great things from this association.

Through our State Board of Health and Board of Medical Examiners we have put our own house in order to such a degree that today we are safe in saying that there is no doctor in the State having the degree of M.D. who has not had schooling enough to be a good doctor. This being the case, if only regular doctors were allowed to practice the healing art, good diagnosis and treatment would be the rule in our State.

But unfortunately this is not the case. Our work is interfered with by practitioners who are not M.D.'s. These false doctors not only oppose and obstruct every advance in science, but carry on an active campaign in which they teach the public to fear and hate the regular doctor.

We have accomplished great things in the past, but how much more we could have accomplished had we not been opposed, will never be known.

Let us consider this false doctor or cultist. Who is he? Why does he exist? How does he exist?

A quack desires to practise medicine, without properly preparing himself for such practice, and actually pretends that he has the necessary knowledge. The reason that he does this is not that he desires to relieve suffering humanity. If he had any such wish he would want to gain the necessary knowledge.

Every cultist is a quack, but every quack is not a cultist. The ordinary layman is not far removed from quackery. Dr. Howard W. Haggard says that nearly everyone is a potential quack and tells the following story to prove it.

A famous nobleman of the sixteenth century one day fell to speculating as to what trade or profession was most common. His jester said that medicine had the

largest number of professors and offered to prove his assertion. The story runs something like this.

The next morning the jester left his quarters with his head swathed in a bandage. The first man that he met asked him what was wrong. On being told, he said that he knew what would cure his trouble. Every one he met, asked what was wrong, and on being told, offered some kind of treatment. Each treatment was different from every other, but was declared to be a sure cure for such a case. When he reached the courtyard of the palace, the attendants surrounded him, each one eager to offer advice.

Finally he reached the duke, who called out at once, "What is the trouble?" On being told, he at once offered a treatment that he knew would cure the trouble. The jester then threw off his bandage and said, "You, too, My Lord, are a doctor. I have on my way hither, although I passed only one street, found more than two hundred others. Everyone in town thinks he is a physician. Can you find more people practising any other profession?"

The friends of the jester were not quacks. They were only potential quacks, but if one of them had attempted to commercialize his useless advice, he would then have become a real quack.

A real quack becomes a cultist whenever he is able to attract to himself a sufficient number of followers to form an organization for the purpose of teaching the propaganda that he wishes to spread abroad.

The potential quack does some harm by giving useless and often wrong advice. The real quack does much more harm, because he takes people's money, and because by advertising himself as a doctor, he often treats large numbers of patients. The cultist does the greatest harm, because he has an organization to help spread false propaganda. This false propaganda is spread not only by the practitioners of the cult, but by laymen who are often influenced by the sales talk of the followers of the cultist.

It is hard for professional people to understand why nearly every layman believes, that without any special study of the subject he is qualified to advise people in medical matters, where even a doctor would hesitate to make a positive statement.

Many cultists never get beyond the quack stage. As an illustration, I will tell a story of my student days.

A lot of hand-bills had been scattered in and about the medical schools that cluster about Cook County Hospital in Chicago, inviting the students to attend a lecture to be given by a doctor in a certain hall.

Some of us attended the lecture and discovered that the so-called doctor was a real quack.

He began his lecture by telling us how he could cure cases where regular doctors had failed. He said that he, himself, had had a cancer that had been so diagnosed by leading surgeons in both Minneapolis and Chicago, and that they had all wanted to operate and remove it. Then he had cured himself by a very simple method of his own discovery.

He told us that we were foolish to spend so many years in a medical school, that taught only a lot of nonsense that would be useless in treating disease; that surgery was never justifiable. That, in the main, there was only one cause for disease and consequently only one line of treatment.

He said that a doctor could learn all that was necessary to learn in two weeks; that he was going to organize a school and invited us to join his class. He told us that if we would come to his school, he could, in two weeks' time, make better doctors out of us than a regular medical school could in several years, and he wanted only \$125 for the two weeks course.

None of the medical students joined his class, but I know of a teamster who did. I never heard of the quack again, so have reason to believe that he never gathered together a sufficient number of followers to form a cult.

The public, it seems, likes to think that the practice of medicine is a simple thing. That there is a simple and universal cure for all diseases. The quack says that this is true. One cause for all diseases and therefore only one line of treatment. How simple! How wonderful! Doctors would like to think so too, but they know better.

Quacks have always existed and, of course, are more numerous than cultists, but many cults have come into being since the days of Hippocrates, flourished for a time and then died out.

Once in a great while a cult takes on some of the education of the regular profession, and if they take on enough of it, they are absorbed. In the last fifty years two cults have been so absorbed by our profession.

All that the regular profession demands of the cultist is that he become educated and ethical.

Is it too much to ask of one, in any profession, that he become educated and ethical? Should these qualifications not be more necessary in medicine than in other professions?

Most of the cultists refuse to comply with these two simple demands and continue their propaganda that consists of telling the public:

That they have discovered something new and wonderful,

That they cure cases where regular doctors fail,

That they are persecuted by a regular medical trust,

That the regular profession is afraid of them and their skill,

That vaccination is a crime,

That surgery is unnecessary, and therefore wrong,

That medicine has had its day and will be superseded by the cult.

These are only a few of the false statements that enter into the sales talk of the cultist. As long as these statements appeal to the public, quacks will use them, but they are every one false.

In the meantime we will go on doing our best to heal the sick, and we will never be satisfied until we reach a

point where everyone lives long enough to die of old age.

We wonder sometimes just what is the attitude of the public towards the regular profession. It can best be illustrated by a story.

A young woman, who had taken an excursion into quackland, returned to her regular physician. He asked her, "What if I should refuse to take you back?" She answered, "Oh, but I know that you won't." He asked, "How do you know that I won't?" She answered, "You will take me back for the same reason that parents take their children back, when they have gone astray. Children often disobey their parents, say mean and sometimes untrue things about them, and even run away from home; all the time knowing that if they get into trouble they can return to the old home, and receive a welcome and forgiveness."

That is the way most people feel towards the medical profession. There is a group, however, about 7 or 8% of our population, whose minds have been so poisoned by quack propaganda that they will never again look upon us with anything but suspicion.

We are greatly annoyed, at times, at the number of unqualified people, who are trying to pose as doctors, when in fact, we should feel complimented. Everything good is counterfeited. If we were not good we would not be counterfeited.

Because we are recognized as being good, the public does not wish to destroy us; neither does the cultist. Both realize that they will need us some day. What doctor present in this room, has not had a cultist appeal to him for aid? The cultists would all be panic-stricken if they thought that the regular medical profession was going out of existence.

The action of the Soviet Russian Government proves that the public does not wish to destroy the medical profession. In their formation of the new order of things, they outlawed and destroyed practically all the other learned professions, but they left the medical profession intact. They were regimented but not destroyed.

The cultist, however, is with us. He has received legal recognition, and in spite of our science, our high standards, and our good work, he goes on his way rejoicing.

What are we going to do about it?

The chances are that we will do little or nothing, the same as we have done in the past, but there are some things that we might do.

We might make a general appeal to the public (just as the cultist does) but that would cause us to do a lot of unethical things. We would have to do a lot of unjustifiable bragging and advertising. We would have to indulge in sales talks and do other things that would be beneath the dignity of our profession.

We could call the attention of the public to what we have done in the past; how we have raised the span of life from 30 years to over 60 years in the last half century, but the public already knows that, and it seems to be unimpressed.

There is one weapon that we could use that would have a real effect. We could refuse to help the cultist

or his patient out. When the cultist is in trouble he comes to the regular doctor for help, and many a cultist would retire from practice if he could not run to us for help. Many patients would not go to quacks, if they knew that they could not return to the regular doctor, when in danger. In the interest of humanity we will not make general use of this weapon.

The only thing left for us it seems is to work through politics, and we are not politicians; neither are we business men.

The cultist, usually, is both a business man and a politician. If he were not; he could not succeed as a cultist.

The average legislator understands the language of the business man and the politician, but he does not understand the language of the medical man.

It behooves the medical man, then, to learn another language.

I say this in all seriousness.

Few, if any of us, want to do this, but if we are to accomplish what should be accomplished, it will have to be done.

Who is going to sacrifice himself for the common good? That is a question that each one must answer for himself. In some counties the political set-up is such that certain doctors can do nothing, but wherever it is feasible each doctor should interest himself in legislation, and perhaps gain a seat in our legislative body.

There is no question but that we could make ourselves felt in politics if we would set ourselves to the task.

In the first place, we must agree as to what we want and then work with the political organization with which we are affiliated.

We should be able to place at least 10 or 15 members in our legislature at each session. If we did this our life-saving program would proceed much faster. The Surgeon General of the United States Public Health Service recently declared that 10 years might be added to our life expectancy, if present medical knowledge were applied fully. The present legislative trends are favorable to our enemies, who are, of course, enemies to public health.

With this situation confronting us, shall we do as we have always done, or shall we take sufficient interest in politics to give the public the full benefit of present medical knowledge? What a great achievement it would be to raise the span of life to over 70 years!

Summary

1. For centuries regular medicine has labored to relieve human suffering and save life.

2. Our profession will never have reached the hill crest of its ambition until everyone dies of old age, instead of disease.

3. Organization has done much to bring about the great advance of the last 50 years.

4. Every M.D. in our State today has had schooling enough to make him a good doctor.

5. With the accumulated knowledge of past centuries at our command we still know little enough, and anyone

knowing less than we do should not be allowed to practice the healing art.

6. Our progress has always been obstructed by cults.

7. We could do more good for humanity if there were no cults.

8. The cultist has influence with legislators because he is not a professional man, and talks from the standpoint of a business man and politician.

9. We are not politicians, and do not speak the language of the politician or the business man.

10. It may be that we should learn what would be to us a new language.

11. The cultist does not want to utterly destroy us, neither do the people. They are afraid that they will need us some day. They will continue to revile us, and persecute us, and say all manner of evil against us, falsely; but they will call upon us in time of trouble.

ADDRESS OF THE PRESIDENT-ELECT OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

E. A. Pittenger, M.D.

Aberdeen, South Dakota

The medical profession during the last few years has been visited by certain groups of uninvited and unwelcome satellites. We have been beset by groups of profit seekers, paid reformers, unscrupulous politicians and the paid agents of certain philanthropists. The profit seekers are a group that would gain from the by-products of a system of socialized medicine. They are the third party, intervening between patient and physician, such as the insurance carriers, the lodge, "the friendly society"; all these would immediately take on new activities and more tax-supported employees. There are certain business firms which would stand to profit from large orders for supplies and building materials resulting from a governmental system of medical care. We also have a very small minority group of physicians whose friendship with unscrupulous politicians would result in their sharing in the spoils.

But the most important in the class of seekers after personal profit are the social workers, a new profession which has been created by professional philanthropy and social welfare. These social workers see in socialization of medicine a multiplication of their work in providing medical relief and also the creation of a fertile field for their fast-growing profession and for the employment of a large number of such social workers. More work—more social workers!

All these profit-seekers know that the complicated administrative work and governmental red tape of a socialized medical program would require thousands of employees, with the high salaried positions picked off by those in power. They also know that the expenses for administration in England have amounted to over half of the total paid to physicians and that the number of non-medical workers in Germany is greater than the total of physicians doing the medical work. And to

pay for this medical care, the workers in Germany must turn over to the Government 6.5% of their monthly earnings.

The paid reformer is ever seeking a panacea for poverty. He would completely change the present facilities for medical service because of a negligible percentage of the people who are said to find illness costs heavy in a given year. The paid reformer has been told, but forgets, that the Committee on the Cost of Medical Care surveyed from month to month for an entire year the health needs of some 39,000 people in this country. Of the total, some 47.9% needed medical care and received it; 47.1% of the people had no need for medical care during the year despite monthly visits of a nurse who was endeavoring to check their needs. This leaves but 5% of the people to be accounted for and, having in mind those who choose to go to cult practitioners, it would appear that there is a negligible, if any, percentage of the people who ask for medical service and do not receive it. The paid reformer has failed to show that the scientific benefits of our present system of quality service should be sacrificed to protect against sickness costs for a negligible percentage of the population.

The unscrupulous politician sees in socialization of medicine the control of a vast new patronage army. Hundreds of choice jobs will be his to pass out. He knows that this system will shunt large sums of money—millions of dollars—into his hands, to be administered by himself and his aides. This form of control will result in less skilled men in the profession, since young men of ability will not be attracted to the conditions of socialized practice. We would have a mechanical system wherein there would be no incentive for research or progress. There would be a loss of independence and an inability to provide treatment thought necessary for the patient, with resulting overwork by the physician and loss of respect by the patient. Changes of administration and the spoils system would cause the practice of medicine to become a political lottery, with political skill, instead of professional skill, rewarded. We differentiate between the unscrupulous politician and the statesman.

The paid agents of certain philanthropists and social workers are interested in the relief of poverty and in securing the resources for such relief. Such social workers distribute cash benefits, not their own money, according to their standards and opinions of what is good for the recipient. They naturally seek to do the same with the services of the physician (also not their property), and resent any implication that they are not equally competent to determine how, and to whom, and in what amounts these services shall be distributed. A number of so-called philanthropic foundations have spent millions of dollars in the past ten years on surveys of medical care. This money might better have been spent for the care of the sick as it was originally intended to be used. These foundations represent no truly public organization, or the people, but extremely limited groups which dominate. These representatives of certain large corporations are interested because of savings in wages

their corporations could effect under a socialized system of medical care. These foundations have never studied or proposed any legislation to increase the money wage of labor so that the individual could select his own physician and be financially able to pay for his care.

We should give careful study to these critics of our profession, but must not be too ready to accept their many untried and illogical suggestions and plans. There are several fundamental facts which the profession must remember and adhere to when any new plan is considered. All features of medical service in any method of medical practice should be under the control of the medical profession. No other body or individual is legally or educationally equipped to exercise such control. No third party must be permitted to come between the patient and his physician in any medical relation. All responsibility for the character of medical service must be borne by the profession. Patients must have absolute freedom to choose a legally qualified doctor of medicine who will serve them from among those qualified to practice and who are willing to give service. The relation between patient and family physician must under all conditions be maintained. Any form of medical service should include, within its scope, all qualified physicians of the locality covered by its operation who wish to give service under the conditions established. Also there should be no restriction on treatment or prescribing not formulated and enforced by the organized medical profession. In formulating any new plan these facts should be rigidly adhered to and we should also remember that the public, in general, finds no real dissatisfaction with the kind of medical service it is receiving. It finds that under the present medical system, American preventive medicine is not equalled anywhere in the world and that American sickness and death rates are lower than in any other country. Also the medical profession has always provided and furnished good medical care. No other class of men is so generous of its service and do so much charity cheerfully. Our critics have failed to show us why we should change this picture.

Now let us study the situation at the present time in our own state medical society and see how we are going to be situated when it becomes necessary for us, as a society, and as individuals, to influence the laws and regulations which are going to govern our practice of medicine. We have just passed through a session of the State legislature in which we encountered a great amount of anti-medical sentiment. It seems that the osteopaths have set out to secure recognition so that they can be eligible to receive payments for their work under the various forms of the Social Security Act. They had a very active and well organized lobby at Pierre throughout the entire session, and seemed to have ample funds to carry on their work. The osteopaths were represented either by friends or relatives on the Public Health Committee in both the House and the Senate and were able to place one of their members on our State Board of Health.

If the medical profession is to receive the proper consideration from the politicians we must take an active

part in our respective parties, and educate the general public on the superiority of medical care over the various cults. The osteopaths are attempting to secure, by legislation, the right to do medical work which is denied them because of insufficient skill and education. They wish to lower the standards of the care of the sick so that they can be allowed to do government work.

It has been suggested by several of our past presidents and I call it to your attention, again, that it is absolutely necessary for several of the doctors in the State to stand for election to the legislature in their respective parties. This has always been important, but at the present time, with all these new medical suggestions before our legislature it is doubly important that we be represented in both houses. By having competent medical men on the Health Committee of both Houses is the only way we can get proper consideration from the political parties in power when these important health matters come up for their consideration.

I also feel that some move should be made to include all practitioners of medicine, in the State, in the society. A committee was appointed last year to give this study but were unable to work out any satisfactory plan. I am requesting this committee to give the matter further study so that they may have some law formulated to present to our legislature in 1938. It has been suggested that an annual registration fee of \$5 should be paid to the office of the secretary of the state medical society. The payment of this fee would entitle the practitioner of medicine to a certificate to practice for the ensuing year and would pay his dues in the state medical society. Whatever this society does to improve the practice of medicine in the State is going to benefit all so engaged in the practice of medicine, and it is no more than fair that all doctors should contribute to the expenses of the society rather than the minority who are doing so now. Within the last two years North Dakota has required such a registration fee of \$5 from all doctors engaged in the active practice of medicine in the State.

There has been a great influx of all forms of cult practitioners into South Dakota in the last few years, since our neighboring States have passed basic science laws. These irregular practitioners have gone into the smaller communities, called themselves "doctors," and most of the people really think they are M. D.'s. To remedy this, during the last session of the legislature a modified basic science law was introduced into the Senate but never got out of the committee. All agree that the time has arrived when we must have a basic science law in South Dakota; and to pass such a law we must start

our program this year and not wait until just before the legislature convenes. With this in mind, I am asking for a committee to be appointed within the next few days to serve for two years or until after the next session of the legislature. The committee is to have the law written, then explain it to the medical profession so that they in turn can start to educate the general public on the fundamental values of such a law. I feel that it can be passed if it is properly explained to the public and we can get the whole hearted coöperation of the entire medical profession.

There has been much discussion regarding the resettlement relief. Your committee of the state medical society asked for some form of relief such as we had in 1934 but the Resettlement officials in Lincoln, Nebraska, and Washington, D. C., insisted that the medical care should be handled by county coöperative associations such as they have in the South. The present plan now in force was not worked out by your committee, but we were told that if we were to secure the relief necessary in many parts of the State, we would have to use their plan. Their attitude was, it was their money and they were going to keep control of it. There is no question that some form of relief is vitally necessary in many parts of the State and for that reason I feel that we should go along with their plan. The referendum vote on the Resettlement relief carried by a good majority and so we should give it our support as long as drought conditions continue to exist, but as soon as conditions return to normal we, of the medical society, should see that it dies a natural death.

It is one of the ironies of fate that our profession, which above all others has taught the world the value of scientific research, should, at a time when the discoveries of medical science have so miraculously relieved mankind of so many ills, be made the victim of erroneous conclusions drawn from research of another sort. We have been put through the wringer of statistical analysis and sociological research, and have come out drenched with printer's ink, confused and harassed by discordant voices contending in continuous debate over socialized medicine. After such an experience, what we of the medical profession need most is rest and a little quiet thought. As your President for the coming year, I realize that I have a great responsibility to fulfill and I assure you that I will give you my best. It is your society and I ask for your aid and coöperation that it may become a better society and if we must have criticism, let it be of the constructive type.

ROSTER SOUTH DAKOTA MEDICAL ASSOCIATION--1937

Membership by Districts

ABERDEEN DISTRICT No. 1

PRESIDENT
King, Owen Aberdeen

SECRETARY
Alway, J. D. Aberdeen

Ahlfs, J. J. Conde
Alway, J. D. Aberdeen
Bates, W. A. Aberdeen
Brinkman, W. C. Veblin
Bruner, J. E. Aberdeen
Bunker, P. G. Aberdeen
Bloemendaal, G. J. Ipswich
Cook, J. F. D. Langford

Driessen, E. M. Britton
Eckrich, J. A. Aberdeen
Elward, L. R. Ashton
Farrell, W. D. Aberdeen
Gelber, M. R. Aberdeen
Graff, L. W. Britton
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Keegan, Agnes Aberdeen
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Rice, D. B. Britton
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Richards, G. H. Watertown
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Gage, E. E.	Sioux Falls
Gregg, John B.	Sioux Falls
Groebner, Otto A.	Sioux Falls

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Hummer, Harry R.	Sioux Falls
Hyden, Anton	Sioux Falls
Keller, S. A.	Sioux Falls
Kittelson, John A.	Sioux Falls
Lamb-Barger, Hazel	Sioux Falls
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Mueller, Julius D.	Flandreau
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Butler, John M.	Hot Springs
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Clark, O. H.	Newell
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Durkee, H. C.	Faith
Dawley, W. A.	Rapid City
Davidson, H. E.	Lead
Ewald, P. P.	Lead
Fleeger, R. B.	Lead

Hare, Carlyle	Spearfish
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Heinemann, A. A.	Wasta
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Hultz, E. B.	Hill City
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Jackson, R. J.	Rapid City
Jackson, A. S.	Lead
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Kegaries, D. L.	Rapid City
Lemley, Ray E.	Rapid City
Mattox, N. E.	Lead
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Manning, F. E.	Custer
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Mills, G. W.	Wall
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Sherrill, S. F.	Belle Fourche
Soe, Carl A.	Lead
Smiley, J. C.	Deadwood
Spain, M. L.	Hot Springs
Stewart, N. W.	Lead
Stewart, J. L.	Nemo
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Overton, R. V.	Winner

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Walters, S. J.	Winner
Malster, R. H.	Carter

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SECRETARY	
Peeke, A. P.	Volga

Bostrom, A. E.	Portland, Ore.
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Grove, E. H.	Arlington
Hopkins, N. K.	Arlington

Peeke, A. P.	Volga
Rozendal, P. H.	Lake Preston
Scanlon, D. L.	Volga

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Flett, Chas.	Milbank
Gregory, D. A.	Milbank
Hawkins, A. P.	Waubay

Jacotel, J. A.	Milbank
Karlins, W. H.	Webster
Pfister, F. F.	Webster
Porter, Oliver M.	Sisseton
Peabody, Percy D.	Webster

* Not member—failed to pay 1937 dues.

** Died, August, 1937.

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Bates, W. A.	Aberdeen
Baughman, D. S.	Madison
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Benesh, L. C.	Freeman
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Billion, T. J.	Sioux Falls
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Bloemendaal, G. J.	Ipswich
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Bobb, C. S.	Mitchell
Boyd, Frank	Mitchell
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Brinkman, W. C.	Veblen
Brown, A. E.	Webster
Brown, R. H.	Watertown
Bruner, J. E.	Aberdeen
Buchanan, R. A.	Huron
Buekelman, W. H.	Stickney
Bunker, P. G.	Aberdeen
Burgess, R. E.	White River
Burman, G. E.	Carthage
Bury, Chas. L.	Geddes
Bushnell, J. W.	Elk Point
Bushnell, W. F.	Elk Point
Butler, J. M.	Hot Springs

Carmack, A. O.	Colome
Chassell, J. L.	Belle Fourche
Christensen, A. H.	Clark
Clark, B. S.	Spokane, Wy.
Clark, O. H.	Newell
Cliff, F. N.	Milbank
Cochran, F. B.	Plankinton
Collins, Howard	Gettysburg
Cook, J. F. D.	Langford
Crane, H. L.	L'Orya, Peru, S. A.
Creamer, Frank	Dupree
Davidson, H. E.	Lead
Davidson, Magni	Brookings
Davis, J. H.	Belle Fourche
Dawley, W. A.	Rapid City
Dehli, H. M.	Colton
Delaney, W. A.	Mitchell
De Vall, F. C.	Garretson
Driessen, E. M.	Britton
Duncan, William	Webster
Durkee, H. C.	Faith
Dyar, B. A.	Pierre
Dyar, Robert	Baltimore
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Elward, L. R.	Ashton
Engelson, C. J.	Brookings
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Farrell, W. D.	Aberdeen
Flett, Chas.	Milbank
Fleeger, R. B.	Lead
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Gage, E. E.	Sioux Falls
Gelber, R. M.	Aberdeen

Gillis, F. D.	Mitchell
Graff, L. W.	Britton
Greenfield, J. C.	Avon
Gregg, J. B.	Sioux Falls
Gregory, D. A.	Milbank
Griffith, W. H.	Huron
Groebe, O. A.	Sioux Falls
Grosvenor, L. N.	Huron
Grove, E. H.	Arlington
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Haas, F. W.	Yankton
Hagin, J. C.	Miller
Hammond, M. J.	Watertown
Hannon, L. J.	Brea, Calif.
Hansen, H. F.	Vermillion
Hare, Carlyle	Spearfish
Hargens, C. W.	Hot Springs
Hart, B. M.	Onida
Hawkins, A. P.	Waubay
Heinemann, A. A.	Wasta
Hershkovitz, S. T.	Clear Lake
Hill, Robert	Ipswich
Hohf, J. A.	Yankton
Hohf, S. M.	Yankton
Hopkins, N. K.	Arlington
Howe, F. S.	Deadwood
Hoyne, A. H.	Salem
Hummer, F. L.	Lead
Hummer, H. R.	Sioux Falls
Hultz, Eugene B.	Hill City
Hyden, Anton	Sioux Falls
Ince, H. J. T.	Rapid City
Jackson, R. J.	Rapid City
Jackson, A. S.	Lead

Jacotel, J. A.	Milbank	Miller, H. A.	Brookings	Sackett, R. F.	Parker	
Jenkins, P. B.	Pierre	Mills, G. W.	Wall	Salladay, I. R.	Pierre	
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**Jones, A. L.	Gregory	Moore-Freshour, Ina L.	Yankton	Schmidt, Hilmer	Estelline	
Jones, T. D.	Bowdle	Morehouse, E. M.	Yankton	Sewell, H. D.	Huron	
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McLaurin, A. A.	Pierre	Rozendal, P. H.	Lake Preston	Zarbaugh, G. F.	Deadwood	
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				Zimmerman, Goldie E.	Sioux Falls	

** Died, August, 1937.

Methods and Motives in Medicine *

W. G. Richards, M.D., F.A.C.P.

Billings, Montana

WHEN a physician essays to diagnose a patient's disease and to treat it, he first sets out to acquire certain sensory stimuli coming from the patient's body. Some of these he receives simply by listening to the patient's complaints; others by his own physical activities, as by the time-honored sequence of inspection, palpation, percussion, and auscultation; others through the medium of more or less complicated devices designed to increase the range of receptivity of his own sensory organs. The microscope and X-ray machine are examples. All these are transmitted to his central nervous system, where they are co-ordinated and correlated, and their relationship determined with memories of past experiences, while at the same time they unavoidably receive an emotional affect. The result of all this is that response on his part which we call his diagnosis, and his recommendations for treatment, are his further response to the mental state induced within him by that diagnosis.

The accuracy and effectiveness of these will depend upon the correctness of each step in the process. The whole result may be invalidated by an initial false sensory impression or by an omission of some vital fact. Such errors we cannot, unfortunately, always avoid. That is not possible in this imperfect scheme of things. But we can avoid some of them. Points are often missed by haste. Adequate time needs to be given each patient, for medicine can never be made into a wholesale business. Fatigue, also, will make one careless and overlook some slight but important sign. No less than in industry, a doctor's working hours need reasonable limitation, and the ambitious individual who tries to give the impression of great popularity and success, with many demands and a crowded waiting room, is likely to be more of a menace than a benefit to his patients.

In recent years, there has been a great multiplication of mechanical devices and chemical tests. Theoretically, this is all to the good, but inaccurate technique or false deductions from them can vitiate their usefulness. Even such a simple device as the stethoscope can do harm by its revelation of a murmur, upon which an undue emphasis is laid rather than upon a broad analysis of all the factors indicating the condition of the heart and the manner in which it is doing its work.

The X-rays are so valuable as an aid to diagnosis that it would be impossible to over-rate them, but the machines require a meticulous technique in their operation, and much skill and knowledge are needed in the interpretation of their showings. Good salesmanship on the part of manufacturers has scattered X-ray outfits widely, both among regular and irregular practitioners, and consequently entirely unjustifiable diag-

noses are often made from them, while films are not infrequently seen so poorly made that no conclusions are justified from them at all. Those of us interested in chest work will remember how much confusion existed in their early use for this purpose from a sheer inability to distinguish between the normal and the abnormal. Unconscious mental factors enter here too. Like all specialists the X-ray man has to guard against the tendency to over-value his particular contribution. I remember a caustic but suggestive comment I once heard at a famous tuberculosis sanitarium, where, exhibiting a certain film, the lecturer remarked that "even an X-ray man could not find evidence of tuberculosis on that." This, however, was some time ago, and since then, he, too, has become more critical. On the other hand, the clinician may fall into the opposite error and pay too little attention to the suggestions of his confrère. Again, in a difficult case too much is sometimes asked of the roentgenologist. In army parlance one tries to pass the buck to him, disregarding the obvious fact that the X-rays will not tell the whole story. I recall a woman's life which was endangered by the waiting for an X-ray diagnosis in a case of intestinal obstruction, an error in which I am sorry to say I participated, and for which I accept my full share of responsibility, though the lesson was a salutary one.

The advent of the technician has brought a fresh crop of possibilities for error. Basal metabolism determinations are a good example. There is a deceptive simplicity about the machines now in use which make it appear that almost anyone can run one, and all the physician has to do is to accept the final figures given him. But the simplicity is only apparent. Besides the multitude of small attentions which must be given to the machine itself for its proper operation, great care is needed to secure the proper conditions in the patient himself. The significance of the term "basal" is not always remembered. With nervous or stupid people it is sometimes impossible to secure these conditions, a failure which the mere figures returned by the technician will not show, for only by careful observation of the patient himself can one appreciate his mental condition. Often, indeed, he appears outwardly calm while inwardly a mental hurricane is passing over him.

The electrocardiograph is a very useful instrument, but it requires most critical interpretation as to both diagnosis and prognosis. With its more general use, Sir Thomas Lewis' warning as to the danger of drawing too fine conclusions will need repeated emphasis.

Laboratory reports need a considerable infusion of the Missouri spirit. A recent instance of a suggested diagnosis of renal glycosuria when the low blood sugar figures were really due to inaccurate reagents is a case in

*Read at the Midland Empire Medical Conference, Billings, Mont., May 3, 1937.

point. The skeptical attitude which saved the physician concerned, whatever it may be in religion, is a commendable virtue in medicine.

In this connection Thomas Addis' remarks in his admirable work on Bright's disease might well be taken to heart in all fields of medicine. "At the present time," he says, "routine work means work done by someone else than the clinician, someone who has no knowledge of the patient or of the purposes for which the work is done. The necessary degree of accuracy in the timing of urine and blood collections and the constant watchful care in the manipulations of the chemical work can come only from someone who has an immediate personal interest in the results. . . Without such special experience and without a personal interest in the patient it is scarcely to be expected that reliable results will be obtained. . . There is more in these examinations than can be expressed in figures. It is the picture as a whole which is suggestive, not the separate items, but the suggestion comes only to the man who knows the patient."¹

The guarding against these inaccuracies in the sensory impressions received is, of course, a function of the mind, but above and beyond this the workings of the mind in the use it makes of these impressions need critical watching.

Of course, both diagnosis and treatment are limited by the mental content of the person responsible for them. One cannot diagnose a disease of which one is ignorant, or utilize a method of treatment one knows nothing about. What we call a disease is simply a mental concept. We find patients presenting a certain aggregation of signs and symptoms, and we call that by a certain name, as, for instance, typhoid fever, with the result that when we again hear this word we recall a mental image of a patient with these characteristics. Later, some one notices that all the individuals of this group are not exactly alike. The symptoms they present tend rather to group into two or more sub-groups. So we revise our original concept and now have two or more diseases instead of the original one. Typhoid fever, you will remember, was originally confused with typhus.

This multiplication of concepts makes progress in medicine, but the price of it is continued vigilance and constant study. Unfortunately, the need of making a living, or, as John Hunter once said, the necessity of "chasing the damn guinea," takes up so much time that often, if one is fortunate enough to build up a practice, little remains for study. Sooner or later, if one is not careful, one's mental content will congeal as of a certain time, and one will get farther and farther from contemporary medicine. As recently said, "It is almost possible to date a man by his methods. There will be the vaccine fan turned out in the opsonin days, the surgeon of a little later date who fixes the abdominal viscera, the man who circumcises all the babies, or blocks the sinuses with gauze, or the one who has one or another special drug for pneumonia."² Nor will the occasional attendance at medical meetings and clinics, nor even a

jaunt to Europe in pleasant society with much sightseeing and a little sitting at the feet of famous teachers, entirely help, valuable though these may be. Constant study and reflection are the only means, for, after all, no one can really be *taught* anything. One must *learn*, and that implies the primeval curse, work, and work by the sweat of one's brow. Then, too, one may become too much preoccupied with other matters. A certain diffusion of interest is good, for it broadens the mind, and the doctor who has no intellectual interests other than medicine can hardly claim to be more than a mere craftsman. But medicine is a jealous god, and brooks not the worship of other gods.

A fruitful source of error is a failure properly to evaluate psychological factors. Unfortunately, a merely materialistic or physical conception of disease is too widely held, though this is often to ignore completely the significance of the patient's complaints. What we call symptoms or signs are physical reactions produced by various stimuli. These reactions may occur in the organ which received the stimulus, as vomiting from unpleasant food introduced into the stomach, or in some part of the body distant from that receiving the stimulus, as vomiting from a bad smell or an unpleasant sight, where the stimulus is upon the endings of the olfactory or ophthalmic nerve, and the response an indirect one through the mediation of the central nervous system. The central nervous system can cause reactions in distant organs through the operation of many factors. Cannon showed how, in a cat, the emotion produced by the proximity of a dog inhibited the movements of the stomach. Emotions are continually producing physical reactions, though there is a great difference in the character of the responses in individuals. A mere unkind remark will cause in one a violent fit of weeping, but, in another, merely a smile or a shrug of the shoulders. The difference comes from the state of the nervous system. The emotional center in one is highly sensitive, and a profound effect results, while in the other it is relatively insensitive, and little effect is produced. Where the emotional center is easily affected it is constantly stimulating and causing responses on the part of various organs of the body, for our emotions are continually being excited. Life at its best is not a smooth proposition. We are continually having unpleasant experiences, and few of us get what we would like. We are all more or less frustrated. As Beatrice Harridan said, "We start in life intending to build a grand cathedral, a crowning glory to architecture, and we end by contriving a mud hut." With most people it is a struggle to get even the necessities of life. In an ecstatic moment men and women marry, only to discover later the personal incompatibilities which make living together one long drawn out agony. Anxieties and fears haunt all of us, and emotional crises sooner or later overtake every one. And yet, as physicians, because these emotional experiences produce physical reactions, we often attack the responding organ, and remove a gall bladder or a fanciful chronic appendix, or give histidine injections for a gastric ulcer which does not exist. Alvarez, you will remember,

estimates that half the people who consult a doctor for digestive troubles are really suffering from so-called functional conditions.

Notwithstanding this, it is rare in case reports to find mention made of the psychological aspect of the patient. No attention is generally paid to his emotional state, nor the conditions of his environment as affecting this, though these may be having a profound influence on the production of his symptoms, and may also have a very great bearing upon the causal relationship between the measures employed for his treatment and his recovery or otherwise. I know of nothing which will produce a more wholesome skepticism as to the therapeutic effects of drugs administered than to carry around a few tablets of plain milk sugar. I have secured the most varied and wonderful results from them. In evaluating the immediate results even of surgery one should remember the profound emotional effects of an operation and the change in environmental conditions from an often unsympathetic family to the constant attentions of trained nurses and the visitations of relatives and friends bringing flowers and other evidences of solicitous interest.

But if the patient's reactions must be scrutinized for other causes than those which seem apparent, no less must the physician's conduct be subjected to similar scrutiny. Bertrand Russell, under the title of "Philosophy's Ulterior Motives," points out the influence of unappreciated factors in the reasonings and conclusions of philosophers, and no less than philosophers do physicians have ulterior and unrecognized motives.

This may be denied, for we prefer the more flattering belief that the single purpose in the mind of every physician is to recognize and cure the disease from which his patient is suffering. Secular writers, on the other hand, have more than suspected the existence of ulterior motives, and some, such as Molière and Bernard Shaw, have even held such pretensions up to ridicule. These, for the most part, have been treated by the medical profession either with a lofty indifference or an air of injured innocence, and the wholesome lessons which might have been derived from them entirely lost. We would rather remember such eulogies as that of Robert Louis Stevenson, or such flattering characterizations as that of Ian Maclaren, and, though we readily admit questionable practices on the part of unorthodox practitioners, we, too often, like the Pharisee of old, fold our virtuous cloaks around us, and with unctuous rectitude thank God that we are not like other men, or even as this chiropractor.

That we may have misgivings in the matter is, however, sometimes evident, for I remember the applause which greeted a clergyman at a medical society banquet, when he said that "the medical and clerical professions had many things in common, one of which was that there was a good deal of humbug about both of them."

Human behavior is a complex matter, and many factors enter into it, not all being within the individual's consciousness. The physician, being human, is similarly influenced. He, too, has his inherited weaknesses and

acquired prejudices. He, too, suffers from the effects of faulty training and the defects of the environment in which he was brought up. He, too, is influenced by the conventional standards of thought and conduct of the society of which he is a part. And he, too, is all the time being affected by his emotions. All these factors may and do enter into everything which he does, and even into what appears such impersonal matters as diagnosis and treatment, for no more than philosophers or even judges is he a purely logical machine.

In fact, none of us are pure reason nor pure will, for unconscious motivation enters largely into all we do, and what appear at first sight to be altruistic motives will often on analysis prove to be purely selfish. Whether we admit it or not, we are all at bottom largely hedonists, and we camouflage this hedonism by ethical or religious professions.

We are all affected by the money motive, for we live in a social system which is based upon competitive principles, and success in life is gauged by acquisitive results. To live in pretentious houses, to own impressive motor cars, to be social leaders ourselves or to have our wives fulfill the same functions as our proxies, are ambitions we all share to a greater or less extent.

To achieve these ambitions requires money, and consciously or unconsciously one's mind will be bent in the direction from which the money may come. Some will turn to surgery, as being the most profitable part of medicine, but the same object may be achieved by elaborate and expensive methods of diagnosis and treatment. Of course there are few so crude as to recommend these when they know there is absolutely no need for them, but I am speaking of unconscious motivation, which plays a far greater part in our lives than most people appreciate. The reasons we give, and give honestly, for our conduct are not always, probably not even generally, the real ones. They may be a factor, but are not *all* the factors, for we utilize the process of rationalization, by which we find reasons for doing those things which we would like to do. Much, indeed, of what passes as reasoning is pure rationalization, and if you will only watch your own conduct in ordinary and unprofessional matters you will soon see how often, when you are arguing in favor of some course of action, you had primarily determined that the action was desirable, and are simply finding reasons for justifying your doing it. You will see the same process at work in legal decisions, where a judge in a lengthy opinion elaborates reasons for some position he is taking, when it is very plain that any other position would be distasteful to him, or run contrary to all his previous training and habits of thought. In our own profession it is noteworthy how very soon methods which bring in the money become popular, and are even justified with an elaborate literature, especially the literature so generously furnished by the makers of drugs and instruments.

Understand I am not contending that we should have no regard for financial rewards. We have to, for, under a money economy, money is the only medium by which

we can exchange our services for life's necessities. But we might as well admit it, and cut out the buncombe by which we try to appear as a lot of altruistic gentlemen practicing medicine for sheer love of humanity or as a Christian virtue. Recognizing it, we will be far more likely to be on our guard against this need of money's influencing our judgment, if only by unconscious mental processes. When the rent is coming due and the secretary asking for back salary, when the wife and the girls are clamoring for new clothes and the boys are reflecting on the antiquity of the automobile, the while the bank account is mildly positive or even negative, one would be either more or less than human not to veer a little in one's judgment in a doubtful case towards a diagnosis which would suggest an operation or some specially remunerative treatment.

I once heard a worldly-wise old cynic remark that no doctor could run a private hospital and remain honest. But the suggestion in this is not only applicable to doctors. It is equally true of all hospitals which depend upon patients' fees, and simply means that unconscious mental processes may influence anyone upon whose shoulders lies the responsibility of finding the wherewithal to keep a hospital running. I think the custom of charging a patient for routine laboratory work is an illustration. The need for laboratory tests should be determined by the responsible physician in each individual case, for, if there is no probability of their furnishing useful information, to charge a patient for them is, to say the least, unfair. Similarly with pathological reports. Recently, I was interviewed by an irate parent, indignant at a charge for such an examination of a removed appendix. He could not see, nor could I either, how, after the appendix had been removed, it could do either him or his daughter the slightest good to have it subjected to an elaborate and expensive examination. One might protest, too, against the attempt to exalt the laboratory into an infallible court of appeal. Pathologists, even the best, not seldom differ, and frequently make mistakes, and very often a gross examination is all that is needed. But again we have the rationalization of the patient's interests.

One can see in oneself this subtle influence of financial interest in law suits. When appearing as a medical witness one unconsciously veers toward the side on which one is, and which presumably is to pay one. Also, when examining a claimant for an insurance company one unconsciously assumes the company's cautious and suspicious attitude.

But besides the money motive there is the love of power. We all want to be exalted above our fellows and to reign superior. This is what engenders professional jealousy, and is very evident in those commercial clinics in which one man reigns supreme. It is rationalized here by the plea that group practice or team work makes for the best interests of the patient. There is, of course, some truth in this. There is in all rationalizations. When a patient can conveniently secure the services of men specially competent in the various branches

of medicine he is most likely to get the best advice, and the ultimate organization of medicine will probably be along these lines. The advantages are evident in the nonprofit clinics connected with all medical schools. But the grouping must be on a purely cooperative basis, free from all megalomaniac tendencies, representing real specialized information, not capitalizing religious affiliations, and always conducted so as to give a square deal to fellow practitioners outside it. Such associations could be of immense service to medicine. It is, however, a little hard to see these conditions in some of the commercial associations, and too often, the megalomania or the money motive shines clearly through all the camouflage.

This power motive, however, is not confined to our own profession. It can be seen not seldom in the clergy, where one man, though preaching humility as a Christian grace, is always finding opportunities to get into the public limelight. Thackeray has given us one such character in the Reverend Charles Honeyman. It is very evident in many politicians, who, while plainly grasping for place and power, talk eloquently of the dear people and their rights.

Another unconscious motivation is sadism. This, as you know, is the love of inflicting pain. We are all guilty of it more or less. As children we pull the legs off insects, or tie cans to dogs' tails. As parents we spank the children. Dickens' Mr. Squeers illustrates it in the schoolmaster, and where I went to school the type was quite common. One I had was a particularly good specimen, as many sore posteriors could testify. It has played a large part in religious persecutions, where it was rationalized by the plea that it was a virtuous action to destroy or torture the body if thereby the soul might be saved. Like all other bad tendencies, it may be turned to good account and is then said to be sublimated. Surgery is said to be one of its sublimations, but sometimes the sublimation seems rather thin. I remember a surgeon in whom for long I suspected it, but felt absolutely certain when I learned the manner in which he punished his children. You can see the same thing in the legal profession, in the pleasure of some prosecuting attorneys in securing convictions, and in the excessive sentences of some judges. In war time, all the mask is thrown off and ruthlessness prevails, often rationalized, of course, by "military necessity." Sherman's march through Georgia is a typical illustration, as well-shown recently in *Gone With the Wind*, and the World War furnished many examples.

When one has made a diagnosis, like a literary production, it becomes the child of one's brain, to be defended against all who would take it from one. When it is based upon deductions from facts about which there is no dispute one resorts to arguments and rationalizations to support it, and it requires a very great preponderance of evidence to overcome the opinion formed. When, however, the diagnosis depends upon sensory impressions, as, for instance, the presence or character of heart murmurs, no amount of argument is likely to con-

vince, for sensory impressions cannot be shared or compared. What one hears as a heart murmur, another either does not hear at all or interprets differently. The differences of opinion are particularly evident when it comes to timing the murmur. Lewis says, "Most people cannot, and never will, time murmurs reliably." It is of no use to argue on such a matter. The same rule applies as in matters of taste. *De gustibus non est disputandum*.

Unconscious and emotional factors are very likely to creep into consultations. The mere fact of being called in to advise implies either that the attending physician is in doubt or that the patient or his relatives are not exactly satisfied, and that the man called in is suspected of being able to supply what is lacking. This in a measure implies superiority, and carries with it a temptation unconsciously to assume a superior attitude, to support which one may take a different view of the case or unnecessarily modify the treatment. Did you ever notice, too, how you are liable to disagree with the man you dislike or the one you consider your most formidable competitor?

However, the fault is not always on the side of the consultant. Sometimes the attending physician has an inflated ego, or it may be an overcompensated inferiority complex, and shows his resentment at what he considers a reflection upon his ability. This makes a most embarrassing situation. Consultations, indeed, are not always conducive to the patient's interests. Differences of opinion may lead to a paralysis of action, and while the doctors are arguing the patient dies.

The position of a doctor in relation to his patient, and the attribution to him of almost miraculous powers as to life and death, can very easily inflate his ego. Fortunately we have shed most of the pomposity of an earlier generation. We no longer carry a gold-headed cane and a bejewelled snuffbox, nor even garb ourselves in the silk hat and frock coat of more recent times. But I think we still like to play the part of a god in the machine. In fact, in some it is easy to see a very distinct identification with God. This is why we so often ignore the patient's point of view entirely, expecting him to submit quietly to the means we devise for his benefit and resenting any objections on his part. I sometimes wonder, though, if patients only realized the changing fads and fancies in treatment whether they would trust themselves to our hands at all. Previously, we took the blood out of them, but now we put it in. Once we deprived them of fluids, but now we drown them in them. There are fads and fancies in electric modalities and lights. We look with scorn on the promiscuous drugging of our predecessors, and prescribe the proprietary mixtures left with us by a horde of travelling

salesmen. At one time we starve our patients and at another time we feed them. I remember the living skeletons who were fortunate enough some years ago to survive a siege of typhoid fever, and the cynicism of the wit who remarked that it took six weeks to recover from the disease and six months to recover from the treatment. Each generation of doctors commences its practice with a positiveness as to the accuracy of the theories it has been taught and the efficacy of its remedies, only to find in a few years most of them demonstrated to be wrong or useless. When a patient rebels we write him down as uncoöperative, as was done of one recently who, hot and copiously sweating from a fever, objected to the mountain of bedclothes piled upon him for fear that he might "catch cold."

Neither are hospitals entirely guiltless. Founded primarily for the sick poor who could be thankful even for a roof over their heads, to say nothing of the pittance of food with which they were supplied and the scant care given them, the tradition of charity still lingers, and even when a patient is paying a good price for his accommodation the attitude towards him seems often that he should take what he gets and be grateful. Compare the alacrity with which a bellboy answers a call in a hotel with the difficulty of getting a floor nurse to answer the number board. I sometimes think that a hard boiled profane efficiency expert let loose in hospitals, both religious and otherwise, might do a world of good. There are ulterior motivations behind them too.

For the same reason, the various inquiries into the methods of medical practice now going on cannot but have beneficial results, even though their specific recommendations may not be adopted. Outsiders often see things to which long use has so accustomed the insider that he fails to notice their defects, and there are evils of which the influence of vested interests prevents reform. Certainly the profession cannot afford to ignore these inquiries, or to dismiss them as the impertinent efforts of officious trouble makers. Our ultimate interests will be best served by a sympathetic coöperation, for if, as the parson said, like the clerical profession there is a good deal of humbug about our own, to recognize and admit this humbug, or even to appreciate the possibilities of it, is the first step towards its prophylaxis. Indeed, in all our goings in and comings out we would do well constantly to bear in mind the wise saying of Jeremiah that "the heart is deceitful above all things; who can know it?" And no one is it more liable to deceive than its possessor.

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History of Medical Education in Minnesota*

Franklin R. Wright, M.D.†

Minneapolis, Minnesota

IN TERRITORIAL DAYS, about 1856, when the University was organized, provision was made in its charter for a Medical School. This school did not come into existence until 1888 when under the direction of Dr. Perry H. Millard of St. Paul, the St. Paul Medical School and the Minnesota Hospital College in Minneapolis gave up their charters and joined to form the University Medical School. The history of these early schools is interesting.

The St. Paul Medical School was organized in 1871. It occupied a building in the neighborhood of Seven Corners. This building was two stories high, had a broad awning in front, and on the side of the awning was labeled saloon. On the side of the building a second floor sign read St. Paul Medical College. A picture of this building was published recently in the magazine section of *The Minneapolis Journal*.¹

Some of the men who brought about this organization and inspired the teaching were Dr. Charles Wheaton; Dr. Alex Stone; Dr. John F. Fulton; Dr. C. E. Riggs; Dr. James Quinn and Dr. Talbot Jones.

In 1881 under the guidance of Dr. Frederick A. Dunsmoor the Minnesota College Hospital was organized in Minneapolis. The Board of Trustees, five in number, consisted of Mr. Thomas Lowry, president; Dr. F. A. Dunsmoor, vice-president, and dean of the School; Dr. George F. French, secretary; Dr. Amos W. Abbott, treasurer, and Mr. Charles Vanderburg, who later was justice on the State Supreme Bench. It is interesting to know the amount of money in those days that was necessary to establish a medical school. Funds to establish this college were provided by the Board of Trustees, Mr. Lowry and Dr. French \$5,000 each, Dr. Dunsmoor \$10,000 and the other two \$2,000 each.

In the early days, about 1854-55, during the rivalry for supremacy between St. Anthony on the east side of the river, and Minneapolis on the west side, there was built in St. Anthony, approximately where the Savage Building or the old Exposition Building now stands, a hotel of about two hundred beds. This hotel was known as the Winslow House. When Minneapolis out-stripped St. Anthony this building fell into disuse. The Board of Trustees of the new College acquired this disused hotel building. It was remodeled to furnish lecture rooms, laboratories, and a thirty-bed hospital was established. The remaining rooms were used as a dormitory for the students, establishing what was probably the first student dormitory in the State of Minnesota.

The feeling between these two rival schools was very friendly, and three members of the faculty in St. Paul, Dr. Riggs, Dr. Wheaton and Dr. Talbot Jones, lectured

in the Minnesota College Hospital while Dr. Dunsmoor lectured on surgery and Dr. Thomas C. Quinby on materia medica and therapeutics in the St. Paul School.

Dr. Thomas Quinby has his office in the Donaldson Building in Minneapolis and is the last surviving member of the original faculty of either of these schools.

In 1885 the Minnesota College Hospital was re-organized and became the Minnesota Hospital College. A new building was built on the corner of Sixth Street and Ninth Avenue South. The faculty was enlarged and a Dental School added.

These pioneer teachers of dentistry believed that dentistry was a specialty in medicine; therefore they required the dental students to take the science branches of medicine with the medical students and to pass the same examinations that were given them.

I registered in the Dental School on the 16th day of September 1887, and by so doing became a student in the Minnesota Hospital College Medical School. Later I came to have a personal acquaintance with every man on the medical faculty which at that time consisted of:

Dr. F. A. Dunsmoor, Dean of the Faculty, professor of surgery.

Dr. J. H. Dunn, professor of clinical surgery.

Dr. J. E. Moore, professor of orthopedic surgery.

Dr. Frank Burton, professor of anatomy.

Dr. J. Clark Stewart, demonstrator of anatomy who had charge of dissecting room.

Dr. R. O. Beard, professor of physiology.

Dr. H. M. Bracken, professor of materia medica.

Dr. C. M. Drew, professor of chemistry and toxicology.

Dr. C. H. Hunter, professor of medicine.

Dr. J. W. Bell, professor of physical diagnosis.

Dr. A. B. Cates, professor of obstetrics.

Dr. A. W. Abbott, professor of gynecology.

Dr. Frank Alport, professor of eye and ear.

Dr. W. S. Layton, professor of nose and throat.

Dr. W. A. Jones, professor of nervous and mental diseases.

Dr. C. L. Wells, professor of children's diseases.

Dr. Max P. Van Der Horck, professor of dermatology.

Of this re-organized faculty Dr. H. M. Bracken, Claremont, Calif., is the only surviving member.

The spirit of the teaching in this old Minnesota school is shown by the fact that the Minnesota Hospital College was one of the first schools in America to require any microscopic laboratory work. Courses in this kind of work had been given in various colleges as elective work but in 1887-88 the University of Michigan at Ann Arbor, and the Minnesota Hospital College of Minneapolis required a course in microscopic histology. This work was under the direction and personal charge

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† Associate professor of urology, University of Minnesota Medical School.

of Dr. J. Clark Stewart. The primitiveness of this course can be understood when I say that there were not microscopes enough to supply the class of fifty so that three or four students used one microscope. When the study of blood was taken up the blood which was used for material for the fifty men was taken from the tip of my finger. This was advance study compared with the curricula of other schools. When I graduated in medicine in 1894, I took an internship at Asbury Hospital. My colleague, who was a graduate of Rush Medical College, Chicago, of that same year, had never looked through a microscope when he arrived at the hospital to take up his internship.

In 1883 the University appointed a board to give the degree of Bachelor of Medicine by examination. Willard B. Pineo was given this degree. The diploma given him is now in the possession of the Hennepin County Medical Society as part of the material gathered for history of early medical teaching in Minnesota.

In 1888 the Medical School of the University of Minnesota became a teaching institution. Under the guidance of the dean, Dr. Perry H. Millard of St.

Paul, a curriculum was arranged which was on a par with that of the high grade medical schools of the East.

The character of Dr. Millard is well shown by an instance which occurred in the first session of the University School. It was announced that lectures would be continued Friday and Saturday following Thanksgiving Day. The students promptly petitioned the faculty that they might have Friday and Saturday as holidays. On Wednesday morning Dr. Millard met his class with the remark that he had received their petition and in reply he could only say that doctors and medical students had no holidays and that the work would go on as usual Friday and Saturday.

What the future holds for the University Medical School I do not know, but judging the future by the past I am sure that the course of study at the University will be on a par with the advancement of medical science and education, and that the University will continue each year to give the public a class of young men and women who are equal in ability and training to the graduates of the best schools and universities in America.

A Clinical Evaluation of a New Feeding* For Premature Infants

Albert V. Stoesser, M.D.† and Evelyn Johnson, M.D.††

Minneapolis, Minn.

THE feeding of the premature infant has always been considered a special problem. Experiences over many years have shown that breast (human) milk is most easily assimilated by the premature baby. In some instances, however, close observers have felt that the response in the growth of the infant has not been entirely satisfactory. The result of these observations has been the preparation of several modifications of the breast milk feeding. Various types of carbohydrate have been added to the milk. Protein in the form of calcium caseinate has been employed to give the breast milk additional value. Small amounts of dry or powdered cow's milk have been mixed with human milk in order to obtain the desired results.

The addition of two per cent calcium caseinate to breast milk has yielded a mixture which is simple to prepare, and which has given a most satisfactory and consistent daily gain in weight. The formula is made by adding 2 grams (one tablespoon) of calcium caseinate to 100 cc. ($3\frac{1}{3}$ ounces) of previously-boiled breast milk. The human milk is at times difficult to obtain, as the infant's own mother generally leaves the hospital after ten days and milk from other mothers may not be available. Economic or physical conditions

may offer sufficient reason for the inability to obtain breast milk from the mother after she leaves the hospital. Mother's milk may be purchased occasionally but it is expensive and such an expense is often a burden to the family.

In the absence of human milk, many formulae of cow's milk have been used. Years ago these feedings were not considered to be as good as breast milk. Lately, however, preparations have been formulated which come very close to being adequate substitutes. Some of the most recent formulae are based on scientific investigations. Following the observations of Uthelm¹ that premature infants have low values for serum protein during the first three months of life, some physicians increased the protein content of the milk mixtures employed for the feeding of the premature infant by adding one-third buttermilk or one-third skimmed lactic acid milk. Lactalbumin was also tried. Finally cow's milk was fortified by the simple addition of one to three per cent calcium caseinate. Tow² reports excellent results in feeding premature babies with this preparation.

Fat absorption interested investigators next, and Holt³ and his colleagues made extensive studies in the fat metabolism of normal, premature, and twin infants. They found that the premature babies did have marked difficulty in fat absorption. There was also a striking difference in the ease with which the different fats were

* From the Pediatric Division of the Department of Pediatrics of the University of Minnesota, at the Minneapolis General Hospital.

† Assistant professor of pediatrics, University of Minnesota.

†† Resident physician, Minneapolis General Hospital.

absorbed. Olive oil was more completely absorbed than butter fat, and thus when olive oil was substituted for butter-fat, there was a more rapid gain in weight. One of the authors (A. V. S.) had also made similar observations in connection with the use of olive oil in newborn babies born of mothers with chronic skin disorders, such as eczema. In view of the work of Hansen⁴, these babies received fats more unsaturated than that of cow's milk as a prophylactic measure for infantile eczema. At first, corn oil was used in place of butter fat and then a change was made to olive oil chiefly because of the remarks of Ladd⁵ concerning the superior value of olive oil in the feeding of infants. Although no skin disorders developed, the most striking observation was the sharp upward turn in the weight curves of the premature infants following the use of the olive oil.

As a result of this observation, it was thought to be worth while to prepare a feeding formula for premature infants containing both calcium caseinate and olive oil. This was considered even in spite of the fact that fairly satisfactory results were being obtained with an evaporated milk feeding⁶. The new mixture was to be composed of skimmed cow's milk, calcium caseinate, olive oil and dextri-maltose, the latter being added to furnish maltose and dextrin which is in line with recommendations of Powers⁷. Three distinct forms of carbohydrate (lactose, maltose and dextrin) are considered by some physicians to be of advantage, in that fermentation is less likely to develop, and the absorption of carbohydrate is more uniform.

Unfortunately, it was soon observed that the formula proposed above was too expensive to prepare in the hospital as a homogeneous mixture. However, it was learned that a very similar product could be obtained as a spray dried powder⁸.

The preparation was intended especially for premature and newborn infants and consisted of 40.6 per cent skimmed milk solids, 10.1 per cent calcium caseinate, 17.5 per cent olive oil and 31.7 per cent dextri-maltose. In view of the fact that vitamin A was removed when the cow's milk was skimmed, halibut liver oil (0.1 per cent) was added.

The powdered milk preparation was accepted as a satisfactory substitute for the special product originally formulated, and it was employed in a dilution of one ounce of powder to 5 ounces of previously-boiled, cooled water. This yielded a palatable preparation with a composition consisting of protein 4 per cent, fat 3.2 per cent, carbohydrate 9.1 per cent, mineral 0.6 per cent and moisture 83.1 per cent. The caloric value was found to be 23 calories per ounce or approximately 77 calories per 100 cc. of fluid mixture. In this simple dilution, the skimmed milk-olive oil formula was considered to be a feeding for the premature infant which could be easily substituted for the boiled breast-milk with 2 per cent calcium caseinate or the cow's milk mixture consisting of equal parts of unsweetened evaporated milk with 3 per cent dextri-maltose.

A very carefully-controlled clinical study was instituted in which the premature babies of the pediatric di-

vision of the Minneapolis General Hospital were considered. During the period of observation very close attention was given to the cardinal points in the management and feeding of the premature infants⁹. The babies received special nursing care. A proper environment was maintained from the moment of birth. Strict isolation technique was followed in order to reduce to a minimum upper respiratory infections and skin disorders. The establishment and maintenance of an adequate fluid intake and feeding was rigidly kept uniform by following a routine method of feeding. Vitamin and iron requirements were supplied in a satisfactory manner.

Two hundred and two premature infants were observed from birth until the time they were discharged from premature care. These babies represented 73 per cent of the premature infants born during the period of observation. The remaining 27 per cent died and were not considered in this study. The infants were divided into two groups according to weight at birth:

1. Premature infants weighing 2000 grams or less (56 babies, 27.7 per cent of the cases).
2. Premature infants weighing 2001 to 2500 grams (146 babies, 72.3 per cent of the cases).

In a more or less alternate fashion, the premature babies of the two groups received the various formulae which were to be compared. Some infants of each group were given boiled breast-milk with 2 per cent calcium caseinate, others received the unsweetened evaporated milk mixture with 3 per cent dextri-maltose, and a third or remaining portion obtained the new preparation of skimmed-milk and olive oil. An attempt was made to give each baby the maximum amount of food required to yield a consistent gain in weight without causing any serious gastro-intestinal disturbances. Complete records were kept and information as to the total initial weight loss was obtained, together with the day of life on which the minimum weight was reached. In addition the day on which the birth weight was regained was noted and the caloric intake per kilogram of body weight on that day was determined. For the sake of simplicity and clearness this data is all summarized in Table I.

There were 12 infants in the lower weight group which were fed the breast-milk formula. The majority of the cases lost 90 to 160 grams (3 to 5.3 ounces) with the minimum weight being reached as early as the third day, and as late as the ninth day of life. About two-thirds of the babies regained their birth weight between the eighth and nineteenth day with an average of fourteen days. Caloric values at this time ranged in most cases from 104 to 145 per kilogram or 47 to 65 per pound of body weight.

Seventeen infants of the lower weight group received the evaporated milk mixture. Except for the difference in the type of feeding they were cared for in exactly the same way as the infants of the breast milk group. The initial total weight loss was 60 to 175 grams (2 to 5.8 ounces) in the majority of the cases. The babies reached their lowest weights as early as the third day, and as late as the twelfth day of life. The birth weight was regained

TABLE I.

Analysis of the Various Groups of Infants With Respect to Total Initial Weight Loss, Day of Minimum Weight, Day on Which Birth Weight Regained, and Caloric Intake per Kilogram of Body Weight on That Day.

Premature Feeding	No. of Cases	See Foot-note	Birth Weight in Grams	Minimum Weight in Grams	Total Initial Weight Loss	Day of Minimum Weight	Day Birth Weight Regained	Caloric Intake per Kilogram on That Day
Premature Infants Weighing 2000 Grams or Less								
Boiled Breast Milk with 2 per cent Calcium Caseinate	12	A	1350-2000	1190-1905	40-260	2-14	5-23	91-153
		B	1690-1995	1580-1865	90-160	3- 9	8-19	104-145
		C	1812	1685	125	6	14	124
Evaporated Milk Mixture, with 3 per cent dextri-maltose	17	A	1365-2000	1200-1945	5-205	2-18	6-22	83-188
		B	1550-2000	1490-1890	60-175	3-12	11-20	102-167
		C	1798	1679	114	7	14	134
Skimmed milk, Olive oil, Calcium Caseinate, and dextri-maltose	27	A	1405-2000	1325-1980	20-170	2- 5	3-14	57-179
		B	1500-1950	1410-1850	85-140	2- 4	6-11	84-126
		C	1741	1639	100	3	8	108
Premature Infants Weighing 2001-2500 Grams								
Boiled Breast Milk with 2 per cent Calcium Caseinate	39	A	2150-2490	1980-2420	20-260	2- 9	3-21	50-150
		B	2260-2460	2135-2350	70-170	2- 6	5-12	82-132
		C	2370	2249	121	4	8	108
Evaporated Milk Mixture, with 3 per cent dextri-maltose	54	A	2030-2500	1900-2465	25-330	2-15	2-26	37-163
		B	2225-2480	2010-2350	55-220	2- 7	5-17	89-139
		C	2347	2207	140	4	11	114
Skimmed milk, Olive oil, Calcium Caseinate, and dextri-maltose	53	A	2005-2470	1855-2430	20-310	2-10	2-21	40-250
		B	2095-2410	1960-2300	70-190	2- 6	6-15	90-139
		C	2247	2120	127	4	10	117

A—Complete range. B—Range of two-thirds of the cases. C—Total average.

in two-thirds of the cases between the eleventh and twentieth day which differs very little from the observations made in connection with the infants fed with breast milk. However, to obtain this same result, the evaporated milk fed babies received slightly higher food intakes, the caloric values being 102 to 167 per kilogram or 45 to 75 per pound of body weight.

The new skimmed milk-olive oil preparation was offered to twenty-seven infants of the lower weight group. Weight losses in two-thirds of the cases ranged from 85 to 140 grams (2.8 to 4.6 ounces) and this loss reached its maximum no later than the fifth day of life. It was rather rapidly regained in the majority of the cases between the sixth and eleventh days of life with an average of eight days. This is a most interesting observation and may indicate that the smaller premature babies quickly adapt themselves to the skimmed milk-olive oil feeding. Furthermore to attain this response only 84 to 126 calories per kilogram or 36 to 57 calories per pound were necessary. In fact, the average caloric intake per kilogram, 108 calories, on the day the birth weight was regained was the lowest in this group.

The infants of the higher weight group were also divided into three sub-groups. Thirty-nine received the breast milk formula, fifty-four received the evaporated milk mixture and fifty-three received the skimmed milk-olive oil preparation. The response to all the feedings as indicated by the length of time necessary to regain the birth weight after the initial loss was practically the same in each instance. The babies fed the breast milk

formula appeared to progress a little better than those of the other two sub-groups. However, all the infants of the higher weight group did very well including those receiving the skimmed milk-olive oil feeding.

Observations were next made as to the length of time the infants remained in the hospital and the caloric intake per kilogram of body weight necessary to attain a weight large enough to permit graduation from premature care. The average weight gain in grams per day of residence in the hospital was also determined. All this data has been summarized in Table II.

The average discharge weights for the infants of each sub-group of the lower weight group were quite close together. The babies of the group receiving the evaporated milk mixture remained the longest in the hospital under the premature care. About two-thirds of the babies in this group were discharged between the ages of thirty-seven and sixty-three days (5 and 9 weeks) with an average of forty-nine days (7 weeks) while the majority of those of the group receiving the breast milk formula left the hospital between the twenty-ninth and forty-sixth day (4 and 6½ weeks) of life with an average residence of thirty-seven days (5 weeks). Practically the same results were obtained with the skimmed milk-olive oil feeding.

Caloric values as high as 200 calories per kilogram of body weight have been reported as necessary to obtain a satisfactory consistent weight gain in the premature infant during the first 4 to 6 weeks of life. This has not been necessary in this study. The majority of the in-

TABLE II.

Analysis of the Various Groups of Infants With Respect to the Day of Discharge From Premature Care, Caloric Intake per Kilogram on That Day and Average Weight Gain in Grams per Day

PREMATURE FEEDING	No. of Cases	See Foot-note	Discharge Weight in Grams	Day of Discharge from Premature Care	Caloric Intake per Kilogram on That Day	Average Weight Gain in Grams per Day
Premature Infants Weighing 2000 Grams or Less						
BOILED BREAST MILK with 2 per cent Calcium Caseinate	12	A B C	2480-2745 2590-2710 2633	27-52 29-46 37	115-179 136-160 143	27-41 29-39 35
EVAPORATED MILK MIXTURE, with 3 per cent dextri-maltose	17	A B C	2505-2870 2610-2790 2680	29-69 37-63 49	138-176 140-170 156	20-33 21-33 25
SKIMMED MILK, OLIVE OIL, Calcium Caseinate, and dextri-maltose	27	A B C	2570-3400 2610-2780 2710	26-50 30-44 36	104-179 132-166 147	26-44 31-40 35
Premature Infants Weighing 2001-2500 Grams						
BOILED BREAST MILK with 2 per cent Calcium Caseinate	39	A B C	2525-3015 2605-2895 2732	9-45 13-29 20	104-203 117-150 137	17-40 26-34 30
EVAPORATED MILK MIXTURE, with 3 per cent dextri-maltose	54	A B C	2550-3300 2625-2790 2721	11-55 16-33 25	94-233 117-166 138	13-39 19-33 26
SKIMMED MILK, OLIVE OIL, Calcium Caseinate, and dextri-maltose	53	A B C	2525-3190 2620-2760 2696	10-35 16-28 23	104-198 137-167 146	24-46 28-42 34

A—Complete range. B—Range of two-thirds of the cases. C—Total average.

infants of the breast milk fed group required only 136 to 160 calories per kilogram of body weight or 60 to 70 per pound of body weight to give a daily weight gain ranging from 29 to 39 grams with an average of 35 grams per day. The group receiving the evaporated milk formula did not do as well in that the caloric intake although as high as 140 to 170 calories per kilogram or 60 to 80 per pound did not yield more than a daily weight gain of 21 to 33 grams in the majority of the babies. The average figure was as low as 25 grams. On the other hand, the skimmed milk-olive oil preparation produced the same daily weight gain as the breast milk feeding, although it did include a few more calories per kilogram to accomplish this result.

The infants of the larger weight group were discharged at an average age of three weeks. There was only a small difference in the various sub-groups, the babies receiving the breast milk remaining in the hospital the shortest time and those obtaining the evaporated milk mixture remaining the longest time. The infants which were fed the skimmed milk-olive oil feeding did not leave the hospital as early as the breast milk group nor as late as the evaporated milk group. They were able to take fairly large amounts of the preparation without the development of regurgitation, or vomiting and frequency of bowel movements, or diarrhea. The caloric intake therefore averaged 146 per kilogram or 66 per pound of body weight which yielded an average daily weight gain of 34 grams, the highest for the babies of the larger weight group. The infants fed the evaporated milk mixture made the poorest showing in that their average daily gain was only 26 grams.

It is interesting to note that the infants in each of the two weight groups responded quite uniformly to the various feedings except in the case of the babies receiving breast milk. With this feeding, the smaller infants gained more rapidly than the larger. Their daily weight

gain was 35 grams per day in comparison with a 30 gram gain per day shown by the larger infants. On the other hand, the babies of both weight groups maintained on the skimmed milk-olive oil feeding made practically the same daily average gains in weight, and this gain was equal to that of the smaller infants receiving the breast milk formula. The variation in the response to the breast milk and the uniformity in the gain from the new preparation revealed the skimmed milk-olive oil preparation as being equal to breast milk for the smaller babies and superior to breast milk for the babies of the larger weight group. This is even more significant in view of the fact that the breast milk was being reinforced with protein in the form of calcium caseinate. During the study the complications of prematurity which developed were fairly evenly divided between the various groups of infants. Occasionally short periods of regurgitation or/and frequent bowel movements with liquid stools would appear. These were a little more common in the groups receiving the breast milk formula. As a whole, however, very few gastro-intestinal disturbances were encountered.

Comment

From the foregoing results it is evident that the new preparation is of value in satisfactorily promoting growth and development in premature infants. By comparison with other types of premature feedings, namely breast milk and evaporated milk, it is found to be equal to or even better than these feedings, especially during the period from the third to the tenth day of life. This period has been considered the phase of a baby's life during which a most careful adjustment of the feeding is made by the infant. If too little or too much food or an improper mixture is offered at this time the premature may not readily respond in a satisfactory way and the result can tend toward a rapidly fatal outcome.

The most essential requirements for the clinical evaluation of infant feeding formulae include an approved method of selection of the cases, strict attention to the possible influence of seasonal variations, and proper premature management. The latter constitutes uniform nursing care, maintenance of satisfactory environment throughout the period of observation, prevention of upper respiratory infections and skin disorders and early establishment and maintenance of an adequate intake of fluid and feeding. When cases are selected in an alternate fashion through all seasons of the year and the method of handling the infants is very carefully kept constant, then the results which are obtained in evaluating any set of infant feedings or formulae should have some clinical value and be worthy of record.

The skimmed milk-olive oil preparation responds well to the clinical tests. It represents a mixture of skimmed-milk solids, calcium caseinate, olive oil and dextrin-maltose in proportions found to date by scientific investigations to be most ideal for the promotion of proper growth and development in the newborn and premature infants. The small as well as large infants assimilate it very easily, with very little digestive disturbance and accordingly gain rapidly in weight. The physiological weight loss is cut to a minimum and the baby gains so rapidly that in a short period of time its weight is great enough to warrant discharge from premature care. The total number of days of residence in the hospital is cut to a low figure.

Summary

1. The skimmed milk-olive oil formula prepared for the feeding of premature infants when breast milk is not available has been given a clinical trial.

2. Eighty premature babies received the new preparation and at the same time fifty-one premature infants were fed a breast milk formula and seventy-one were offered an evaporated milk mixture. The latter two groups acted as controls.

3. The clinical evaluation of the feeding was as carefully controlled as the facilities of the hospital would permit. A satisfactory schedule of premature management and feeding was constantly followed. Complete records were kept during the entire period of observation.

4. No attempt has been made to present at this time an elaborate statistical analysis of the data obtained. A simple study of the results revealed that the skimmed milk-olive oil formula was easily assimilated by the infants with a birth weight below 2000 grams, and in this respect it equaled the breast milk formula and surpassed the evaporated milk mixture. The larger infants with a birth weight over 2000 grams which received the new preparation made a better showing than the other two units of larger weight group which were fed the breast milk and the evaporated milk.

5. The preparation may prove to be a valuable addition to our knowledge of premature feeding and at the same time lend itself to further modification. Further studies are indicated.

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Silicosis*

C. S. Raadquist, M. D.

Hibbing, Minn.

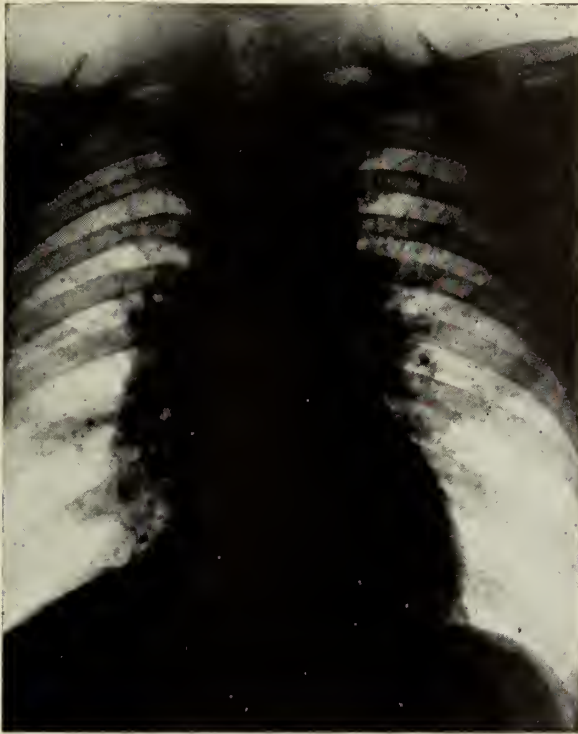
THE Committee on Pneumoconiosis of the Industrial Hygiene Section of the American Public Health Association defines silicosis as follows: "Silicosis is a disease due to breathing air containing silica, characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs, and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis, and by characteristic X-ray findings."

Silicosis is caused by the inhalation of air in which dust containing free silica is suspended. The particles of silica must be small enough to enter the finer air spaces of the lungs. These conditions are present in such occupations as driving of tunnels, development of

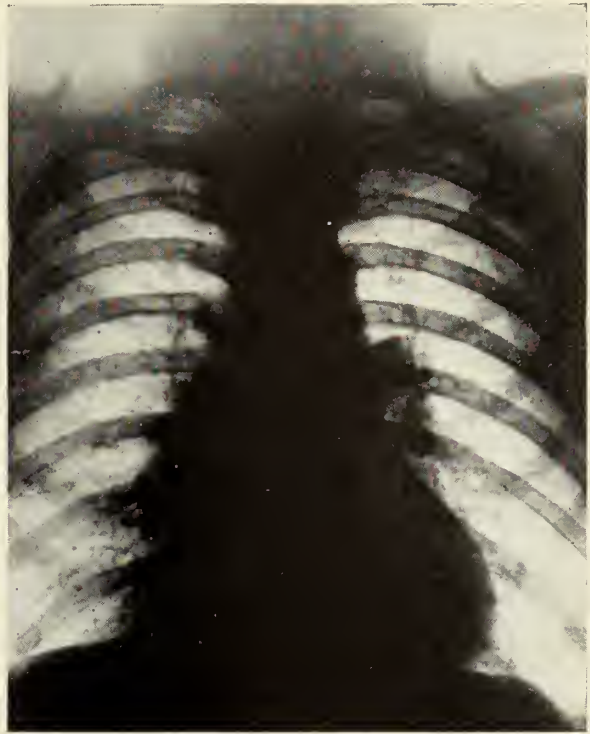
highways, in the mining industry, smelting and refining of ores, quarrying and carving of stone, particularly granite, and the processing of various forms of free silica.

The pathology resulting from breathing air containing silica is fibrosis. This condition has until quite recently been spoken of under the general term, pneumoconiosis. Other dusts, when inhaled long enough and in sufficient concentration, will cause a definite pulmonary fibrosis, but it has been shown clinically and experimentally that the nodular fibrosis characteristic of this disease is caused only by inhalation of silica. It was at first believed that the injury caused by the silica particles was due to mechanical irritation caused by its hard cutting edges but it has been shown by Gardner experimentally that carborundum dust of greater hardness than silica does not produce the miliary nodulation characteristic of

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FIRST STAGE SILICOSIS
Note increase in hilus shadows.



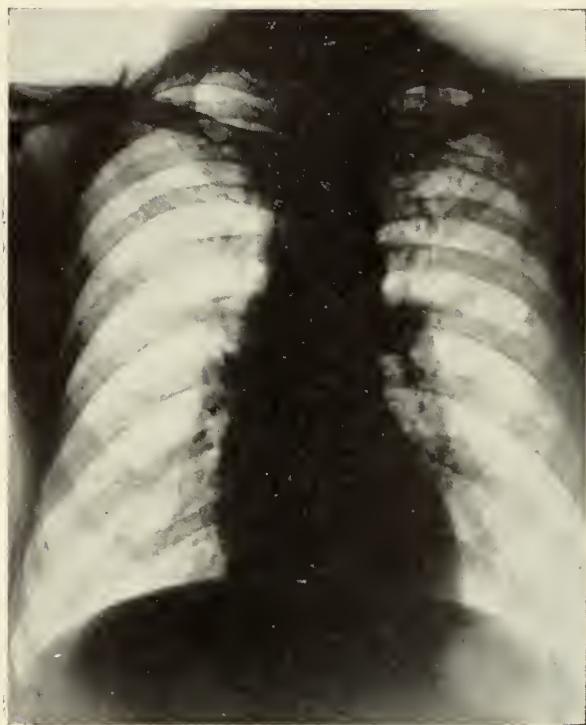
FIRST STAGE SILICOSIS
Note marked increase in hilus shadows.

silicosis. It has been shown by Gye and Kettle that silica in solution or non-crystalline form exerts a toxic action upon the tissues causing proliferation of fibroblastic cells. Miller and Sayers have shown by experimental studies on animals that only dust containing silica has uniformly produced proliferative reaction. Other dusts have been either completely absorbed, leaving no scar tissue, or have remained unchanged in the form in which they were injected. They determined three types of reactions by injecting intraperitoneally in animals a ten per cent suspension of various dusts in physiological sodium chloride. Type 1: Absorption or dissolution of the dust. The dust particles as well as the lesions gradually disappeared. Type 2: Inert reaction. There was no absorption or any tissue reaction. All the dusts injected that contained no silica produced one of these reactions. Type 3: Proliferative reaction. The silica dust alone produced this reaction.

From these experimental studies it appears that the pathology of silicosis is brought about in the following manner: The silica dust suspended in the air enters the finer divisions of the lungs, the terminal bronchioles and air sacs, where, attacked by the phagocytic cells, a solution of silica is formed. The silica in solution exerts a chemically toxic action upon the tissues leading to proliferation of fibroblastic cells. Then are formed the characteristic nodules of hyaline fibrous tissue characteristic of silicosis. The nodules increase in size by extension at their periphery. Adjacent areas may coalesce and bring about further involvement.

It appears from the literature on the condition that no nationality is exempt, and that all races are susceptible. It is possible that previous occupations may be a predisposing factor if the individual has been exposed to dust or other respiratory irritants. Respiratory infections have been shown to be the greatest predisposing and complicating factor in the development of silicosis. In regard to individual susceptibility, if there is any difference, it must be considered an acquired and not a congenital condition. Perfectly functioning nasal passages may retard the development. Lehman in his experiment using dust with a high silica percentage, found that the average retention by the nose in the cases of non-silicotics was about 50 per cent, while in the case of miners with silicosis the average retention was only about 22 per cent. The robust type of individual with less respiratory reserve appears to be somewhat more susceptible than slender individuals. Men who have had respiratory disease, especially tuberculosis, are apparently more readily affected by silica dust. Besides tuberculosis must be mentioned bronchial asthma, chronic bronchitis, bronchiectasis, emphysema, and pleurisy as favoring the development of the condition by lessening the ability of the lung to rid itself of foreign materials. Sinus infection may act by decreasing the efficiency of the upper respiratory tract in removal of dust from the air passages to the lungs.

The silicotic individual is much more susceptible to tuberculosis than the normal man. Due to the permanent lung damage by the silica dust, such persons stand



SECOND STAGE SILICOSIS
Note mottling through both lung fields.



SECOND STAGE SILICOSIS
Shows mottling throughout both lung fields.

a much lesser chance of overcoming the disease even with proper care. An analysis of the mortality statistics of 12 insurance companies for 1915-1916 by Lang and Vane, shows that the actual mortality rate from tuberculosis among persons exposed to silica dust was about three times that of a group not so exposed. If this comparison is limited to the occupations with a very great silica exposure such as metal mining, sandstone and granite quarries, the death rate is about ten times that of the non-silicotic group. Gardner has stated that at least 75 per cent of those who develop silicosis die of tuberculosis. This may be so if all the industries having a silica hazard are considered as a whole. However, it is my impression from my studies of iron miners, that the mortality rate from tuberculosis as a complication of silicosis among them is low, probably not much greater than among those not affected with silicosis. It has been shown by Kettle, Price, and others, that the tubercle bacillus grows more rapidly upon culture media to which a small amount of silica has been added. Gardner has shown that animals exposed to silica when inoculated with a strain of tuberculosis of low virulence will develop tuberculosis and die, while animals not exposed to silica are not seriously affected.

The stages of silicosis are, in the United States, called first, second, and third. The symptoms of the uncomplicated first stage are few and indefinite, and in most instances, entirely lacking. The man's working capacity is not noticeably impaired and he appears as well as usual. It has been stated that recurrent colds, slight cough, slight shortness of breath on exertion, are the

most common symptoms. However, the number showing even these symptoms is small and it is questionable if men in this group show them any more than those having no silicotic condition. Chest expansion may be slightly less than normal. From symptoms alone it is impossible even to suspect the condition when it is in the first stage. The radiograph gives the earliest specific indication of its presence. Therefore, all miners should be subjected to both pre-employment and periodic X-ray examinations. The radiographic appearance consists of small discrete mottling. This characteristic mottling is due to shadows cast by nodules of fibrous tissue and is essential to the diagnosis of silicosis. Then, there is bronchial accentuation. The entire bronchial tree increases in density and can often be traced to the outer margins of the lungs. Near the hilum along the thickened bronchial tree are small spots. When these spots appear throughout the lower section of the lungs, the case is classified as beginning, first stage silicosis. As the disease advances, the spots increase in number, density, and size. Now remember, in order to diagnose silicosis, the spots must be present. As stated there always is, or almost always is, an increase in the density of the bronchial tree, but this, also, is the case in many other conditions. Large calcified spots in the hilum shadows may be significant, especially if there are many of them. Pitcher claims cases where such calcifications involved the entire hilum. It is claimed that these calcifications are larger than those resulting from childhood tuberculosis.

Second Stage: The symptoms as a rule are more pronounced. There often is definite shortness of breath on exertion. Often there is pain in the chest, recurrent colds are more frequent, and usually there is a dry morning cough. The man's appearance may still be healthy, but he is easily fatigued. There is noticeable decrease in chest expansion. However, even in this stage, there is a surprising number who show very few symptoms. Their working capacity is not impaired. If such individuals could change their occupation so that any further exposure is stopped, it is quite possible that they might lead a useful life for their expected number of years. There is further accentuation in the radiographic findings. Throughout both lung fields there is medium-sized mottling. The spots are larger, more numerous, denser, and clearer, in outline. The mottling is usually about equal on both sides. This would indicate that the condition started on both sides about the same time.

Third Stage: There is further accentuation of all the symptoms. Even on slight exertion the dyspnea is distressing. The cough is more distressing; it may be productive or dry. Expansion is greatly decreased. Due to the respiratory difficulty, a great load is placed upon the heart. Its rate is increased and it may become dilated. There is usually some loss of weight. The radiographic appearance is more striking. The mottling is more marked. There is a tendency to coalescence of the spots so that we see large fibrotic areas of marked density. These areas may be very similar to tuberculous consolidation.

As stated, tuberculosis may complicate any stage of silicosis. In diagnosing this complication both the clinical findings and X-ray appearance must be taken into account. The X-ray findings may be very confusing, especially in the third stage when large areas of fibrosis have formed. In the first, and early second stages, when the silicosis is still confined to small spots, the differentiation is, of course, less complicated. It was noted in the Pitcher cases that, in beginning tuberculosis, areas of density were observed in one or both apices. These areas were not as dense as the fibrotic areas of silicosis.

Simpson, of Trudeau, states that the sputum in silicotic patients becomes positive very late; that it is possible to diagnose tuberculosis in these patients very much earlier by the X-ray. Lately, experimental studies done at Saranac Lake, appear to show that the silicosis on the Iron Ranges in Minnesota is not as serious as that caused by silica in combination with other ores and material. The iron appears to have an inhibiting effect upon the action of the silica. Gardner claims that tuberculosis in iron miners is much slower than in workers in other mines such as lead and zinc. He claims that silicosis is not progressive after exposure is stopped.

Prevention of silicosis comes under two main divisions, mechanical and medical. It is up to the engineers to find means for preventing or decreasing the amount of silica dust in the air, or, when it gets into the air, to prevent it from being inhaled. Wet methods have been

used in the mining industry to prevent the dust from getting into the air. In other occupations, air filtering arrangements which will secure clean air for dusty air have proved successful. In mining and the driving of tunnels, blasting is the source of much of the dust in the air. Doing the blasting after regular working hours or between shifts will greatly lessen exposure. In occupations where there must always be a fairly high concentration of silica dust in the air, the workmen should be frequently changed. If the total exposure in such occupations can be limited to one year it is believed serious trouble can be prevented.

Pre-employment and periodic physical and X-ray examinations should be made of all employees in occupations where they are at all exposed to silica dust. If infections can be lessened or prevented it will aid the silicosis problem greatly, because the rate of progress of silicosis in the absence of infection is so slow that the individual affected may never be disabled.

It is essential that there be close co-operation between the engineering and the medical personnel. If the most practical methods that have been discovered and that will be discovered are put into operation under capable direction, the silicosis problem will be largely solved.

Some of my personal observations among the iron miners of the Hibbing district follow. This work has been done at the Adams Hospital in co-operation with the other physicians on the staff. Since August, 1933, chest X-ray examinations have been made on 501 miners. Of this number, 392 or 78.24 per cent were entirely negative. Seventy-eight, or 15.56 per cent, had defects such as broncho-vascular accentuation without silicosis, pleurisy, or cardiac hypertrophy. Twenty-eight, or 5.58 per cent, showed first stage silicosis; 3, or 0.59 per cent, showed second stage silicosis. There was none in the third stage.

Of the 501 men examined, 195 were surface miners, and 306 underground miners. Of the 195 surface miners, 177 were entirely negative, 17 showed other defects such as broncho-vascular accentuation, pleurisy, and cardiac hypertrophy. There was some question if one had a beginning silicotic condition. Of the 306 underground miners, 205, or 66.99 per cent, were entirely negative. Seventy, or 22.87 per cent, had defects, such as broncho-vascular accentuation, pleurisy, and cardiac hypertrophy. Twenty-eight, or 9.15 per cent, showed first stage silicosis; 3, or 0.98 per cent, showed second stage silicosis. There was none in the third stage. All the men showing any silicotic condition with the possible exception of one, were underground miners. Of the three showing second stage silicosis, one was 46 years old and had worked underground 23 years. No chance to check this man up in the usual periodic check-up examinations occurred, as he left his job. The second man showing this stage is 60 years old, has worked underground 25 years, and has a chest expansion of one inch. Physical and X-ray examinations after one year showed no accentuation of findings. He has been working underground at his usual work. The third man was 43 years old, has

worked underground 23 years, and had a chest expansion of two inches. During the past year he has been working underground at his usual work. Physical and X-ray examinations after one year showed no progress of the condition.

The ages of the men showing first stage silicosis ranged from 28 to 59 years with an average age of 44 years. They had been working underground for from one to 27 years with an average of 14 years underground. They had an average chest expansion of 2.84 inches. Physical and X-ray examinations after one year showed no increase of findings. They have all been working underground at their usual work.

The 205 underground miners with negative findings had an average of 14 years underground. This shows that the condition is slow to develop in iron miners.

The absence of any aggravation of symptoms or any accentuation of the X-ray findings in the periodic exam-

inations after one year, during which the first and second stage groups had been working underground at their usual work, indicates that the condition, even when started, is very slowly progressive in iron ore miners.

In regard to tuberculosis: Considering the data obtained from examining this number of men, the impression prevails that the tuberculosis problem among the iron miners is not so serious. The findings enumerated at least indicate that silicosis is slow to develop in iron miners; also that tuberculosis is slow to develop as a complication after a silicotic condition has started. Of the 501 miners examined, there was not a single case of definite tuberculosis. There were two or three with slightly suspicious X-ray findings but in the periodic re-check after one year there was no accentuation in these findings. Several of these cases showed healed childhood tuberculosis.

A Method of Roentgen Pelvimetry*

A Preliminary Report

Owen F. Robbins, M.D.†

Minneapolis, Minn.

THE VALUE of roentgen pelvimetry has been proven repeatedly by various investigators. Thoms¹ states that he is convinced that only by roentgenometric means can the true proportions of the superior strait be determined, and, furthermore, that the ordinary external methods of pelvimetry are often misleading. From his work, Thoms has concluded that every primipara and every multipara with a history of previous difficult labors should be measured by means of the X-ray. For this reason it is essential that every well equipped hospital, which has a maternity service, should have facilities for the study of pelves radiographically.

There is a tendency for men doing obstetrics to look upon roentgen measurement of the pelvis as a procedure which entails the use of costly equipment. This, on the contrary, is not true, for there are very accurate methods, which use for their apparatus materials which can be purchased reasonably or can be made by a good carpenter. This equipment can be added to the standard X-ray found in most hospitals.

Roentgen rays were first used in 1897 for the study of the pelvis. This early work was done by Budin² who emphasized the fact that the shape of the circumference of the superior strait was more important than the antero-posterior diameter. Pinard and Varnier³ tried to make radiographic measurements by comparing the exposure of the pelvis in the living with a normal dried pelvis taken under identical conditions. Albert⁴ in 1899

advocated the use of the semi-recumbent position in order to get the plane of the superior strait parallel to the film. Because of technical difficulties his films were too blurred to be of any value. However, his position is still used in many of the methods of the present day. Fabre⁵ the next year described his frame method. A metal frame with notches at every centimeter was placed around the pelvis in the plane of the superior strait. From the film the outline of the inlet was drawn on graph paper in its exact dimension and the diameters measured. The work of these men done only a few years after the discovery of the X-ray established roentgen pelvimetry as a definite procedure.

Moore⁶ divides the existing methods into five types:

Comparative: Radiograms are taken of a dried pelvis. These are compared with radiograms of pelves in living individuals under similar conditions. A matching of the radiograms, so to speak, and referring back to the original dried pelvis for measurements.

Teleoroentographic: By establishing a long focal distance with the superior strait of the pelvis parallel to the film. Distortion is at a minimum.

Frame: By this method a scale is superimposed at the same level at which the measurements are to be taken and when the exposure is made, the super-imposed scale on the film is distorted in the same proportion as the region to be measured. Measurements are then read directly on the film from the distorted scale.

Triangulation: A study of triangles with known quantities. The procedure involves the same principles of

*Read before the Minnesota Association of Obstetricians & Gynecologists by invitation, Minneapolis, Minnesota, January 16, 1937.

†Instructor in the Department of Obstetrics and Gynecology, University of Minnesota, Minneapolis.

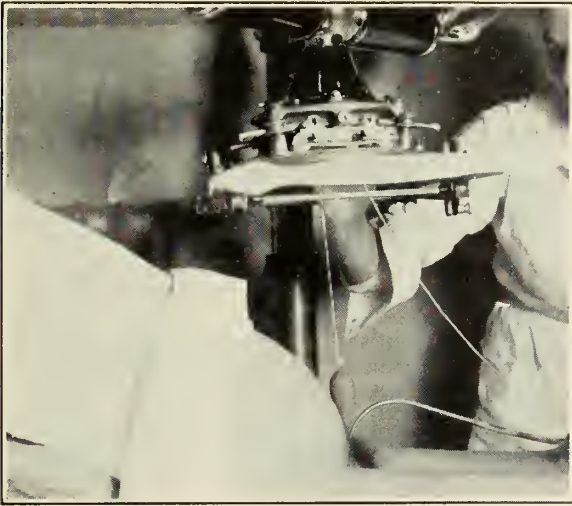


Fig. 1. The patient is resting against the backrest. The symphyseometer is in place to measure the distance of the upper border of the symphysis from the table top. The plumb bob centers the tube four centimeters behind the symphysis.

mathematics and radiology as used in the localization of foreign bodies.

Stereoröntgenographic: The patient is first placed in such a position that the obstetrical landmarks will be clearly seen. Stereoscopic films are taken with a known tube shift and a known focal distance. Computations must be made by the use of precalculated tables and formulas or by means of mechanical devices used to reconstruct the problem involved.

The method which I wish to present at this time is a modification of the Thoms⁷ method, which was introduced in 1929. This is a frame method and can be used only for measuring the inlet. In making a study of a pelvis by this means, the outlet must be measured by the ordinary methods of outlet pelvimetry. Thoms' method is as follows: First the patient is placed in a semi-recumbent position such that the plane of the superior strait is parallel to the film. The height of the symphysis above the film is measured. The tube target is centered five centimeters posterior to the symphysis at 32 inches from the film. The picture is taken. The patient is removed from the table, the tube target and film remaining *in situ*. The lead grid is substituted for the patient at the height determined and a second flash exposure is made on the same film.

Thoms states that his method is accurate to two millimeters from a study of dried pelvises. He states that the height of the grid may vary as much as four centimeters from the height of the plane of the superior strait with no more than 0.6 centimeter error in the final calculation.

The method to be described was devised while working on a study of the fetal head-bladder relationships in which accurate methods were desirable. In this problem it was necessary to place the patient in a semi-recumbent position with the backrest at about a 40-degree angle with the horizontal. In studying the plates obtained, we

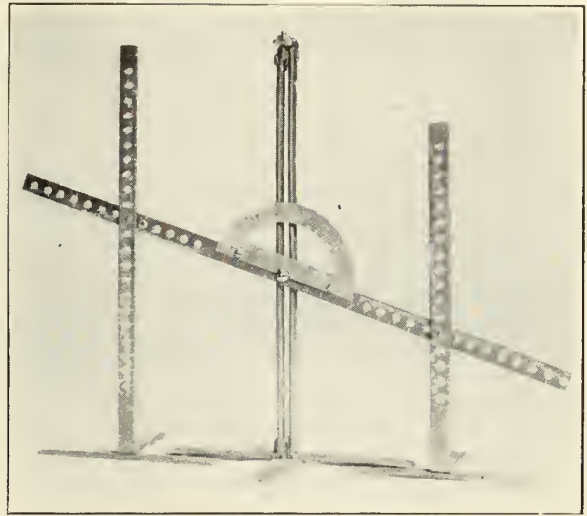


Fig. 2. The calculator.

were impressed with the large percentage which showed clearly defined pelvic inlets. This was true in those patients at term as well as those in the earlier months of gestation. From these findings it was concluded that it was not necessary to have the patient sitting up as acutely as in the Thoms method and thereby a clearer definition of the superior strait could be obtained in pregnancies at term. To add to the accuracy of the procedure, instruments were devised whereby the grid could be placed in the exact angle that the plane of the superior strait had borne to the horizontal. The grid could be angled as much as 30 degrees without the occurrence of foreshortening. In the entire series of over 200 patients, it was only rarely necessary to tilt the grid more than 30 degrees. In those patients who did require more angling of the grid, it was necessary only to raise the backrest several notches to compensate.

These instruments, as well as the grid, were made in the carpenter shop of the Minneapolis General Hospital at a very small cost.

Apparatus

The backrest is of the ordinary hospital type being narrowed somewhat in order that it might fit on the Bucky diaphragm. In the region of the spinous process of the fifth lumbar vertebra a slit is made in the canvas so that the height of the posterior point (to be described later) could be determined.

The symphyseometer (Fig. 1) which is used to measure the distance from the table top to the upper border of the symphysis, is a steel upright on which slides a sleeve to which is attached an old pelvimeter arm. The height is read off on the upright.

The calculator (Fig. 2) is designed to make calculation of height and angle of the grid a simple procedure. It consists of three upright bars with bases. On the central upright is a centimeter scale. A wire is placed in such a way that the angle may be read off on a protractor placed on a horizontal bar. The horizontal bar is

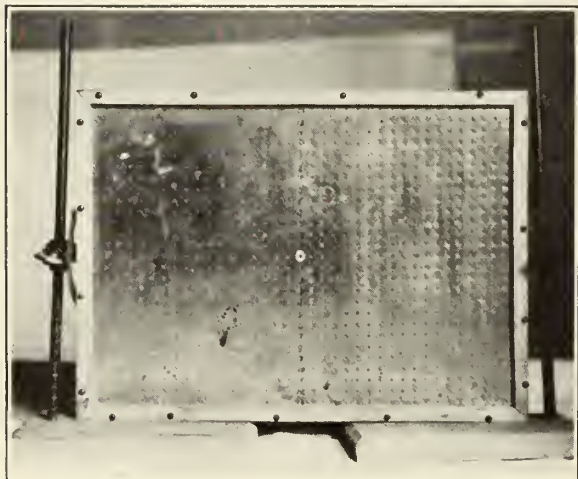


Fig. 3. The grid (Modified Thoms).

perforated in such a way that a set-screw may be adjusted at any distance from the center and at any height on each of the lateral bars which have threaded holes a centimeter apart.

The grid (Fig. 3) is an ordinary Thoms grid which has an added feature in the protractor and the centimeter scale on each of the supporting uprights. The grid may be set at the desired angle and the desired height. For purposes of centering, the central hole is circled and the other holes numbered as shown.

Technique

The external conjugate of the patient is determined by external measurement. An adhesive tape marker is placed between the spinous processes of the fourth and fifth lumbar vertebrae. This represents the location of the promontory of the sacrum.

The patient is placed on the backrest (Fig. 1) which is set at approximately a 40 degree angle. The distance from the table top to the adhesive marker is determined. The slit in the backrest facilitates this measurement. The distance from the upper border of the symphysis to the table top is measured with the symphyseometer.

The tube target is placed at 30 inches. The plumb bob centers the tube over a point four centimeters behind the symphysis. The rays will then pass approximately through the middle of the pelvic inlet. The picture is taken, the tube and film are left as they are.

Knowing the length of the external conjugate and the height of the adhesive marker and symphysis, the angle and height of the grid can be determined by the calculator. This is done (Fig. 2) by placing a set-screw in a hole on the horizontal bar which represents one-half the external conjugate. On one side the set-screw is screwed into the hole which corresponds to the height of the symphysis and on the other the hole which represents the height of the adhesive marker. The angle is read on the protractor. The height will show on the central upright.

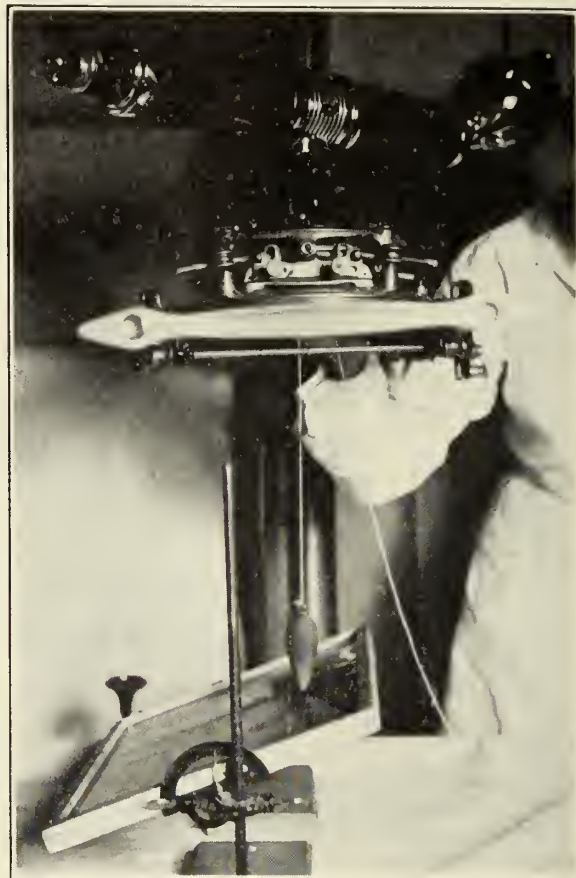


Fig. 4. Method of placing grid so that it has the same relationship to the film and tube that the superior strait had had.

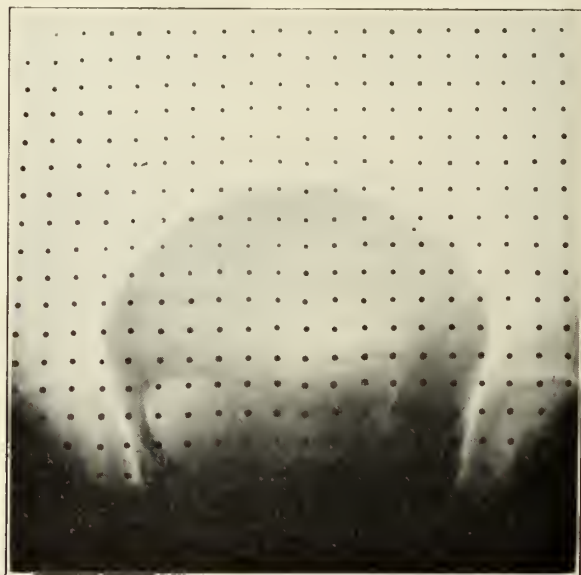


Fig. 5. Typical plate.

The grid is now set at the desired angle and height and is set on the Bucky table. With the plumb bob as a guide, the grid is placed in such a way that it has the

same relationship to the film that the plane of the superior strait once had had. This is done by moving the grid (Fig. 4) so that the plumb bob centers over the hole on the grid which is four minus one-half the external conjugate.

A second exposure is made on the same film.

Figure 5 shows a typical picture. Unfortunately it did not reproduce well in the photograph. From this film the conjugata vera and greater transverse diameter can be read off directly.

If in the film there appears to be too much of the sacrum showing, it is in that group of patients who must be set up more acutely. This group represents about 20 per cent of the 207 patients studied.

Conclusions

A modification of Thoms' method of roentgen pelvimetry is described. It presents the advantages of the original method and overcomes the disadvantage of the lack of a clear picture of the inlet in term pregnancies by a different positioning of the patient. The change of position is compensated for by the use of instruments which make it possible to place the grid in the exact

angle which the plane of the superior strait makes with the horizontal.

I wish to thank Dr. J. C. Litzenberg, professor of obstetrics and gynecology and Dr. John A. Urner, associate professor of obstetrics and gynecology at the University of Minnesota, for their help in the preparation of this paper. I also wish to thank the Roentgenological Department of the Minneapolis General Hospital for their assistance in this work.

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CASE REPORT

SENSITIVITY TO SCARLET FEVER STREPTOCOCCUS TOXIN IMMUNIZING DOSE

LLEWELLYN R. COLE, M.D.

*Director, Department of Student Health
University of Wisconsin*

This brief report of the reaction in an individual following one of a series of immunizing doses of scarlet fever streptococcus toxin is intended to remind physicians that such procedures are not without danger, and that the time element becomes of greater importance as it increases.

This case (A.A.S.—52190) was seen in the Student Infirmary at the University of Wisconsin a short time ago, and impressed upon those of us who observed it the gravity of such generally used measures as scarlet fever immunization where there is, apparently, some sensitizing of the individual by the streptococcus antigen. It points out the necessity for extreme caution in these cases, as well as the care necessary in observing that the time limit between doses must be kept to a low maximum and not be exceeded without danger of severe reaction.

The patient was a fourth year medical student preparing for his service in the Isolation Hospital, and he was taking the series of scarlet fever immunizing doses prescribed for those students who had positive Dick tests. An interval of four weeks had elapsed between the third and fourth doses. He appeared and was given his fourth dose with no particular questioning in regard to the date of the preceding dose. This dose was given at 10:50 A. M. with no immediate ill effects. At noon he had a sudden chill with profuse diaphoresis followed by nausea, vomiting and diarrhea which occurred almost simultaneously. The vomitus was watery and bloody as well as the stool. There was intense abdominal pain, frequent watery stools which showed much bright red blood, and frequent hematemesis with bright blood. The prostration increased and a physician was summoned who sent the patient to the Infirmary. When seen at the Infirmary the patient was much prostrated, the skin was cold and "leaky," the respirations were sighing, the voice was very weak, the temperature was 94.8 F.;

the blood pressure on admission was 106/74, but quickly fell to 70/60. The pulse was of fair quality and 84 per minute, but soon rose to 116. There was marked epigastric tenderness. Examination of the lungs revealed no pathology. The patient began to complain of numbness in his fingers and hands, and the blood pressure dropped to 60/48 in spite of supportive therapy, which consisted of local heat, caffeine sodium benzoate, adrenalin, fluids, etc. During the course of the first ten hours the blood pressure rose to 80/54 but fluctuated between 60/48 and 80/54. The temperature rose to 101.8 F. During the course of the first twenty-four hours the entire urinary output was 10 cc. On the following day there was a bright red flush over the entire body which gradually faded in the course of twenty-four hours.

The past medical history revealed acute nephritis in childhood and we feared a recurrence of this difficulty with the present insult. The blood picture at the time of admission showed 90% hemoglobin; 6,060,000 red blood cells; 23,100 white blood cells; 61% neutrophils; 33% stab cells; 4% small lymphocytes; 1% monocytes; and 1% metamyelocytes. On the following day the white blood count rose to 36,100 with 73% neutrophils; and 23% stab cells, 2% small lymphocytes, and 2% eosinophiles. The blood count gradually returned to normal so that on the day of discharge, eight days later, it was completely normal again. The urine revealed a few casts and a trace of albumin but nothing more. The Wassermann was negative, the blood N.P.N. 33 mg. and the blood sugar 86 mg. per 100 cc. The only complaint after the acute part of the episode had passed was generalized body and muscle soreness. The patient recovered and was discharged after eight days.

This case should point out the importance of carefully checking time intervals when giving therapy of this type, and if more than a week has passed to be very cautious, and not to administer in such cases as the one reported. The symptoms of an anaphylactic reaction with an associated increase in the permeability of the capillary bed were present in this patient, as indicated by the bleeding into the gastro-intestinal tract with the symptoms of shock and prostration. A dilatation of the superficial vascular bed was apparent from the bright red flush that appeared.

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DECREASING INCIDENCE OF PULMONARY ABSCESS

Hedblom collected a series of 2,458 cases of pulmonary abscess from the world's literature and found that 26.7 per cent followed surgery. He was of the opinion that in this country from one-third to two-thirds of the total number of abscesses are post-operative. King and Lord reported 210 cases, 55.7 per cent of whom recently had operations on the upper respiratory tract and 9 per cent followed other operations under general anesthesia.

Such workers as Smith have established a close relationship between the bacterial flora of the mouth and nose and that of pulmonary abscess, and Lemon has shown that material introduced into the mouths of anesthetized animals frequently finds its way into the bronchial tree. Since the close relationship between oral hygiene and pulmonary abscesses has been understood, most cautious surgeons insist upon having the mouths of their patients rendered as free from micro-organisms as possible before performing operations. Moreover, they prefer to do surgery about the mouth and throat under local anesthesia so the cough reflex is not abolished. Great care is also being exercised by surgeons with reference to position of patient, anesthesia, etc., to prevent material from the mouth and nose reaching the bronchial tree of the patient. Moreover, the use of carbon-dioxide inhalations following surgery and encouraging the patient to cough and expectorate any secretions

which may have reached the lower respiratory tract, is an attempt to prevent abscess formation. Where such precautions are practiced by surgeons, a definitely decreased incidence of post-operative pulmonary abscesses has occurred.

By no means are all pulmonary abscesses post-operative. Indeed, in forty-eight of the 210 cases reported by King and Lord, the onset was insidious and the cause was not determined. In a small group, pneumonia immediately preceded the abscess. In cases of pneumonia which do not resolve at the usual time the bronchoscopist is often able to remove mucous plugs which results in free drainage and disappearance of atelectasis, and, thus, abscess may be prevented. Today numerous foreign bodies are also being removed by the bronchoscopist before abscess formation has occurred. Persons who are unconscious from any cause, such as accident, alcohol, narcotic, or epilepsy, should be placed in such position that material from the mouth and nose cannot gravitate to the bronchial tree.

It has long been observed that abscesses and gangrene of the lung are seen much less frequently in children than adults. This probably is due to the fact that the mouth of the child has not become so contaminated with the organisms capable of producing pulmonary abscesses. In fact, one rarely finds pyorrhea in children. Observation has also shown that fewer pulmonary abscesses develop in women than in men. It seems more than likely that the better oral hygiene which women

employ, generally speaking, accounts in no small part for their lower incidence of abscesses.

In addition to the great care exercised by surgeons, much credit must also go to the campaign for better oral hygiene as taught in the schools through tooth-brush drills, awarding gold stars to children who meet the necessary requirements with regard to their teeth, and to the fine educational program in this field by the practicing dentists of the nation.

Such preventive measures apparently have had a definite influence on the incidence of pulmonary abscess. Within a period of approximately ten years in some parts of the country, the incidence has been reduced more than one-half.

J. A. M.

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REGIONAL ILEITIS

Hagen has told us that since Crohn, Ginzburg and Oppenheimer first, in 1932, described the entity known as regional ileitis, 50 cases have been reported in the literature. It is most frequently confused with some form of colitis, and approximately 50 per cent of the cases reported have previously been operated upon for appendicitis. In any widespread effort, then, to reduce mortality from appendicitis, such pathology should be borne in mind.

Clinically, this disease is suggested by recurrent attacks of diarrhea, pain in the right lower quadrant, nausea, vomiting, a low fever and leucocyte count. Often a mass is palpable in the appendiceal region. In advanced cases, the involved intestinal loops roentgenologically resemble a cotton string, a finding designated by Kantor as the "string sign."

Pathologically, there is a thickening and tubular constriction of the lumen of the terminal eight to 12 inches of the ileum. This induration and inflammation often involves the mesentery. Ulceration of the mucosa develops, obstruction often ensues, and fistulae form. No specific microorganisms have been awarded the etiologic rôle.

The significance of recognizing the process clinically lies in preparedness to treat properly the lesion at operation. Opinion is now beginning to crystallize regarding correct treatment. Meyer and Rosi believe that acute regional enteritis limited to the bowel, and not associated with mesenteric thickening, may resolve spontaneously.

Chronic regional enteritis with stenosis is best treated by resection or a short-circuiting operation. When complicated by an external intestinal fistula, resection of the involved bowel with the fistulous tract is necessary to close the fistula.

Significant is the fact that reports of cases are already filtering into the literature from the rural and less populous districts. Outposts have already been established, and the frontier is pressing onward in the conquest of a new disease.

J. E. S.

SOUP THERMOMETERS

There should be a law regulating the temperature of liquids served in public eating places. Often consisting of soups or beverages on the assumption that these can be swallowed without the annoying delay imposed by time-consuming mastication, if too hot they are not only unpleasant but actually harmful. Chicken broth, as everyone knows, has pretty much the same surface appearance whether scalding hot or merely warm; and so has a cup of hot chocolate; and this is true whether served at a lunch counter or in the home. As it is now, we have no warning. Good manners compel us to swallow the fiery potion, when by right we should spew it out.

It has been suggested that the greater prevalence of cancer of the throat among Chinese men than women might be due to the fact that the men eat at the first table while the rice served is exceedingly hot. The women, who eat after the men, are not subjected to this thermal infliction.

So far as we know, no study has been made of the comparative incidence of cancer of the stomach in persons who eat and hastily swallow very hot foods and those who avoid this possible danger. In this day of haste in eating going hand in hand with the increase of gastric ulcer and cancer, such statistical study might yield information of an illuminating nature. Certain it is that the temperature of foodstuffs, especially soups and beverages, varies tremendously. With the modern gadgets that have already entered the culinary art, it should be simple enough in like manner as we now order a "three or four-minute egg" to be able to ask for soups and beverages of certain temperatures with the assurance that they be obtained as ordered.

Until this matter can be arranged, we propose that hurried mortals carry soup thermometers in self defense. The consternation stricken hostess might never forgive the rudeness but neither could she ever forget the impressive lesson entirely justifiable in the light of cancer provoking possibilities.

A. E. H.

Societies

PROCEEDINGS OF THE SECOND NATIONAL CONFERENCE ON COLLEGE HYGIENE*

The First National Conference on College Hygiene was held in 1931 at Syracuse University under the sponsorship of the President's Committee of Fifty on College Hygiene, the American Student Health Association and the National Health Council. Its purpose was "to focus the attention of our most competent authorities upon the identification of the basic problems of college hygiene; secure their expert analysis of those problems; and then have them formulate a consequent statement of their conclusions."

The Second National Conference on College Hygiene was held under the same auspices and with a similar purpose in Washington, D. C., December 28-31, 1936. Under the leadership of President Livingston Farrand and according to plans developed by Dr. William F. Snow, Miss Louise Strachan and an Organizing Committee each of the 347 registered delegates joined or was assigned a place in one of the five Sections on one of the 25 working committees of the Conference. The results of the deliberations of the working committees were summarized in each Section and are briefly set forth by Dr. Kendall Emerson and his Continuation Committee in the 112-page report herewith reviewed.

The Section on Organization and Correlation under the leadership of Dr. Thomas Storey included the following among its conclusions:

(1) "College authorities have a definite responsibility to organize and maintain a college hygiene program that will effectively assist students in preparing themselves physically, mentally and socially for healthful living, for wholesome home building and parenthood, and for wise leadership in the formation and maintenance of high standards of individual, group, and community health."

(2) "It should be the policy of the college to give the student the best possible practical opportunities for securing experience in the wise management of his affairs while sick." "Whether or not a college shall become *in loco parentis* for its students when ill, can be decided only by its trustees."

(3) College authorities should make a planned effort to "build up a teaching relationship between the physician in the student health service staff and the individual student who comes to him for health examination, conference, consultation or other help."

(4) "The responsibility rests on college authorities to have its department of physical education activities so organized that it will consider leadership in the formation of health habits and health ideals as one of the determining objectives of the department."

(5) "Appointment to the college staff should be contingent on the candidate's passing satisfactorily a health examination."

(6) "There should be no competition in the practice of medicine and dentistry between the full-time college staff and local private practitioners."

(7) "It is urged that college authorities organize their hygiene program as a unit made up of effectively cooperating officers, committees, departments, division and schools."

The Section on Student Health Service under the leadership of Dr. Ralph I. Canuteson included among other conclusions the following:

(1) "It is recommended that there be one full-time physician for approximately each 500 resident students. . . . There should be thirty beds for every thousand resident students. . . . There should be one nurse for every eight beds."

(2) "Surgical operations and other strictly clinical treatment of an extensive nature are not a primary function of the

* Health in Colleges. Proceedings of the Second National Conference on College Hygiene. Compiled by the National Tuberculosis Association. Cloth. Pp. 112. New York City: National Tuberculosis Association, 1937.

college, but should be undertaken only because of conditions which may practically demand such activity of the college.

(3) "College matriculation for all new students, either graduate or undergraduate, should not be considered complete until a health examination has been given by a physician and his recommendation for the admission of the student has been made. . . . Where possible annual health examinations for all students are recommended."

(4) "The health service should bring all reasonable pressure to bear in order that students secure corrections of remediable conditions."

(5) "The Standard Classified Nomenclature of Diseases is advised."

The Section on Health Teaching led by Mrs. Kathleen W. Wooten included the following in their conclusions:

(1) "There should be a required course in hygiene of not less than two semester hours in all institutions of the collegiate grade. . . . Credit should be given for such a course."

(2) "Health teaching in college must be recognized as one of the most difficult teaching assignments in the college curriculum. . . . The qualifications of the teachers as to personality as well as to sound professional training become particularly important."

(3) "The subject matter presented should be developed with reference to the student's own problems."

(4) "Most effective consideration of student health problems can be obtained in classes small enough to allow for individual participation in the discussions."

The Section on Special Problems under the chairmanship of Dr. Jesse Williams summarized its conclusions under its subcommittee headings. Among those conclusions we find the following:

(1a) "It should be realized that mental ill health or maladjustment . . . is essentially a clinical manifestation . . . it is fundamentally a medical concern . . . it is therefore urged that the approach to this category of problems be under the direction of a physician qualified in psychiatry."

(b) The maximum load per full-time psychiatrist should be 150 treatment cases per academic year.

(c) "After the psychiatric unit has become established, about 10% annually of the student body may be expected to use it."

(d) "It is just as important a function to discourage negative material as to encourage the positive."

(2a) "The food needs of college students are characteristically those of the period of growth—higher proportions of growth—promoting materials and larger allowances of energy-bearing foods."

(b) "It is *optimum* in contrast to passable health that the college nutrition program should have as its objective."

(c) "In all college dining halls and cafeterias a fully qualified trained dietician should be in charge."

"In fraternity and sorority houses the advisory assistance of a trained dietician should be made available by the college administration."

(d) "To reach all students the fundamentals (of nutrition) should be taught as an important unit in the course in freshman hygiene."

(3a) "There should be a proper distribution of required and elective class work and provision for all students (including athletes) to acquire skill in a variety of activities including those of recreative, continuing types, and minimum achievement standards for all students (including athletes) should be set."

(b) "An individual physical education program should be provided for all students who are unfit for participation in normal activities."

(4a) "College hygiene should deal at least with four major aspects of social hygiene: (1) educational; (2) social-protective; (3) legal; (4) medical."

(b) "There should be in each college an effective committee representing the several departments concerned with social hygiene instruction and problems. . . ."

(c) "The committee approves and recommends special attention to courses on marriage and the family. . . ."

(5a) "Colleges and universities must accept the responsibility for seeing that all places in which students are housed . . .

are safe, sanitary and properly managed from the standpoint of health."

(b) "It is recommended that special care be taken to insure an effective spread of opportunity for sharing in recreation and all forms of social activity among students . . ."

(6a) "A complete history of all new students should be taken to discover (tuberculosis) contact cases and the nature of previous lung infection in the student or his family . . ."

(b) "A physical examination should be made of all students on admission and annually thereafter."

(c) "Intradermal tuberculin tests (Mantoux) should be done on all entering students."

(d) "Routine flat X-ray films of the chest are recommended on all new students showing a positive tuberculin reaction and should be repeated on such cases yearly."

(e) "Routine flat X-ray films of the chest are recommended as a matter of record on all new students, regardless of the tuberculin reaction, when sufficient funds are available."

The Section on the Relation of College Hygiene to Teacher Training and Secondary Schools under the chairmanship of Dr. John Sundwall attempted with considerable success to answer the three following questions:

(1) "In view of the fact that many preventable and correctable physical defects are found through the medical entrance examinations of college freshmen, what may be expected of secondary schools in the prevention and correction of such defects and what can the colleges do to assist them?"

(2) "In view of the fact that recent health knowledge tests of college freshmen indicate that hygiene instruction in secondary schools is uncertain and variable, what may be expected of secondary education to improve quantity and quality of its health instruction and how can colleges coöperate to bring this about?"

(3) "What relationship should exist between regular college hygiene instruction and hygiene training courses designed for teachers in the secondary schools?"

In the 112 pages are assembled the conclusions of our most competent college health authorities. Between the reports of different committees some slight discrepancies are discoverable. Throughout the entire report there is discernable, however, the very definite conclusion that college health programs have very important functions to perform but that these functions are primarily preventive and educational rather than therapeutic.

Let us hope that every college administrator and student health worker will have the opportunity to review this little volume since it so obviously presents a true consensus of opinion in this important field.

D. F. SMILEY, M.D.

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of March 11, 1937.

Dr. Donald McCarthy, Presiding.

ARTIFICIAL FEVER AND PRONTYLIN AS ADJUNCTS IN THE TREATMENT OF MENINGO- COCCIC INFECTIONS

DR. E. S. PLATOU, and DR. M. COOK, (by invitation).

Doctors Platou and Cook presented a preliminary report on experiments carried out with meningococci. These indicate:

1. That most strains of the meningococcus have a relatively short thermal death time *in vitro*.
2. That the course of meningococcal infection in *Macacus Rhesus* monkeys is influenced favorably by fever therapy. (Five strains employed).
3. That certain types of human meningococcus infections recover following the use of hyperthermia. (The authors reported two from their own and two from Dr. Bennett's service).
4. That prontylin (sulfanilamide) will protect mice against large doses of meningococci and may serve as a valuable adjunct to serum therapy in human meningococcal infection.

The details of the authors' work on meningococcal infection will be published more fully in another communication.

Case Report:

Streptococcal Meningitis Treated With Prontosil— Recovery

DR. E. D. ANDERSON

Abstract

A case of hemolytic streptococcal meningitis of otitic origin was reported. The child was treated with prontosil and prontylin, and made a rapid and complete recovery.

Discussion

DR. E. S. PLATOU: From the evidence available it would seem that prontosil and prontylin may offer us something quite promising in the treatment of virulent hemolytic streptococcus and meningococcal infections. We have had experience with the drug in several different types of infection during the past few months at the Minneapolis General Hospital. Although the results seem encouraging our series with controls are still too small to warrant any conclusions. I think, however, that we must not lose sight of accepted principles of treatment that are well established when we use this or any other new method of treatment. Sixty per cent of 102 cases of purulent meningitis observed at the hospital had otitic and sinus foci that were suppurative. It should be borne in mind that in all the recovered cases of purulent meningitis reported in the literature to date, two things have uniformly been done, namely, eradication of the focus and spinal drainage.

DR. WILLARD D. WHITE: This case report is very interesting. Dr. Anderson is to be congratulated on the splendid outcome. He has brought out a point which bears emphasis. When a new substance is used in the treatment of a serious condition and a favorable outcome is the result it is natural to ascribe the success to the new substance. However, as Dr. Anderson has related there are something like 76 cases where streptococcus has been found in the cerebrospinal fluid and the patient has gotten well. These have all occurred previous to the advent of prontosil. I remember one such case that I saw during my internship at Cook County Hospital. A nurse had had scarlet fever, otitis media, mastoiditis and finally, streptococcus meningitis. She was on the service of Dr. Frederic Tice and I was interne on this service. We naturally thought when we found the streptococcus that a fatal outcome would be almost certain. She was treated in the ordinary way, the mastoid operated upon, repeated spinal punctures done and she got well. I happened to see her on the street a year or so later in Chicago and she was entirely well.

In my opinion Dr. Anderson sounds the right note when he states that there is some possibility that the recovery of such patients might be due to other factors in the treatment besides the use of prontosil. The use of this substance may be and probably is of great aid.

DR. H. B. SWEETSER, JR.: I had two cases at St. Mary's who had acute hemolytic streptococci in their sinuses, one in the maxillary and one in the frontal. They did not have meningitis but they did have a streptococcus infection. We used prontolyn and prontosil. In neither of them was there any particular effect to be observed from the drug. I think, as Dr. White says, we are going to be very enthusiastic about this new dye, but after a while we may find certain limitations as Dr. Platou did in his work. I did not mean to criticize Dr. Anderson. I think he is to be congratulated on the way this patient has been handled.

There is one thing I want to say,—that as I grow older it seems I become more confused instead of less confused. That might be an obvious statement, I don't know; but it has been taken as an axiom that any focus of infection should be drained. We all recognize that if we have an acute frontal sinus or an acute ethmoid sinus, opening it might produce a brain abscess or meningitis, so usually such an infection is left alone. It seems to me that is true of abscessed teeth sometimes. Apparently that is different from other situations as seen by an ordinary internist because you always drain every hemolytic streptococcus focus and perhaps my experience has been different from the experience of nose and throat men.

DR. E. D. ANDERSON: I would gather that if a man reports a case of recovery from some particular form of treatment, it

is immediately assumed that he is going around stating that this treatment is a cure for all ills. This is far from the fact in this case. I do feel that when we have a drug which is shown to have an effect on hemolytic streptococci, and when we get a result such as was obtained in this case, we are justified in reporting it. I would be the last one to say that every case of hemolytic streptococci would be cured by prontosil, as no one knows. All I do say is that this boy made a complete recovery following the use of prontosil and I must admit that I got quite a kick out of seeing him do it. As to the question of cleaning up the focus of infection in streptococcal meningitis, to me this case is interesting from this standpoint. I am very sure some might criticize me for not having a mastoidectomy done on this boy. There is no question that he had an ear condition but X-ray showed comparatively little destruction of cells on that side. It seemed to me, inasmuch as meningitis and not his ear was the primary condition, that we were justified in letting the mastoid ride. We did so and the child recovered and under the same circumstances we would do the same again.

TRACHEOTOMY: A STUDY OF 65 CONSECUTIVE CASES

LAWRENCE R. BOIES, M.D.

The operation of tracheotomy is done for one of two purposes—to relieve impending suffocation when there is obstruction at the glottis, or to provide an added factor of safety preliminary to surgical treatment or radiation in certain cases of tumor in or adjacent to the larynx. In the latter condition, the selection of tracheotomy is the unquestioned procedure. When an obstructive laryngitis due to a recent acute inflammation, or edema of the glottis from some other cause exists, the merits of intubation are usually first considered.

It is not my purpose in this brief discussion to consider in detail the factors in a choice between intubation or tracheotomy. The following considerations express the attitude of the majority of contributors to the current literature on this subject:

1. Intubation may be suitable in the relief of laryngeal obstruction when the need for this relief is for a relatively short duration.

2. It is unsuitable when there is a membrane formation below the level of the larynx or there is much secretion which should be afforded removal.

3. An infant tends to take food or fluids poorly by mouth with an intubation tube in place.

4. Intubation requires that an experienced intubator be available to put the tube back once it is coughed out.

5. Repeated intubations or prolonged use of an intubation tube may produce an irritation in the subglottic area which may cause stenosis. Tucker has emphasized the fact that tracheotomy conserves the laryngeal structure better than intubation in infants.

6. The factor of drainage provided by tracheotomy in the acute fulminating infections has probably been overlooked.

7. The fact that a tracheotomy opening does not admit air warmed and moistened in the upper respiratory tract has been shown from clinical experience to be an unimportant consideration. The use of a warm steam room is a satisfactory substitute.

There seem to be misconceptions regarding the mortality and ill effects from tracheotomy. This review was suggested by that fact.

In the five year period preceding January 1st, 1937, I have had the opportunity to observe 65 consecutive cases of tracheotomy on the laryngologic service at the University, and in my private practice. In the same period, 10 additional tracheotomies were performed at the University Hospital by the general surgical staff. In this same period but one intubation was done. This is accounted for by the fact that there is no contagious service at the University Hospital and cases of obstructive laryngitis due to diphtheria are not encountered. A number of cases of mild obstructive laryngitis were encountered in which adequate nursing care and the removal of secretions through the direct laryngoscopic exposure effected a cure.

Tracheotomy was performed in the 65 cases for the following conditions:

1. Tumors

Larynx—

Carcinoma	32
Multiple papillomata	2
Chondroma	1
Adjacent to the glottis (upper end of esophagus, pharynx, epiglottis, piriform sinus, etc.)	11

2. Infections

Acute—

Originating in pharynx or larynx	8
Laryngotracheo-bronchitis	2
Chronic	
Syphilis or tuberculosis (1 each)	2

3. Paralysis

Bilateral recurrent paralysis following thyroid surgery	2
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4. Trauma

Stenosis from fracture of larynx	1
Edema from a blow on the larynx	1
Edema from bronchoscopic removal of foreign body	2
For removal of a foreign body	1

There were four deaths following tracheotomy. One was in a case of an inoperable carcinoma of the larynx in which a fatal hemorrhage occurred from the tumor and death four days after the operation. Another death occurred from pneumonia following a lateral pharyngotomy for cancer of the post-cricoid area. The tracheotomy had been done 10 days previously. The third case was in a 3 year old child invalided by Little's disease who developed an acute throat infection with laryngeal obstruction. Death occurred apparently from sepsis a few hours after the operation. The fourth case was one of acute laryngotracheo-bronchitis relieved temporarily by tracheotomy but requiring repeated bronchoscopic removal of the glue-like membrane from the trachea and bronchi. Death occurred several days after the tracheotomy.

It would seem incorrect to designate these as surgical mortalities due to tracheotomy.

In the other 61 cases, the performance of tracheotomy was not followed by an increase in morbidity. In the cases of marked laryngeal obstruction, tracheotomy brought dramatic relief of this terrifying symptom.

A variable amount of tracheitis and bronchitis usually follows. There is a moderate temporary elevation of temperature and cough. With adequate nursing care, which is highly important, the reaction promptly subsides.

Tracheotomies have been classified as "Emergency" and "Orderly." The emergency type is fortunately much the less common and denotes a circumstance in which there is the sudden need to open the trachea below the cricoid cartilage. The trying conditions under which this is done are in sharp contrast to the ease with which most orderly tracheotomies are done except in the cases with short fat necks. Emergency tracheotomies can be converted to the orderly type by the insertion of a bronchoscope through the glottis into the trachea. This provision, however, is usually not available to the average case requiring the operation unless it be done within access to the physician equipped to do bronchoscopy. There is a very satisfactory substitute, however, in the form of this instrument known as the Mosher life saving tube. This slide illustrates its use. It can be introduced with the same maneuvers used to introduce intubation tubes, but more easily.

The technic of tracheotomy is well standardized among laryngologists. The old descriptive terms of high, low, or median tracheotomy have been discarded. All tracheotomies should be low except those preliminary to laryngectomy when conservation of as much of the trachea as is possible is important.

We prefer the removal of a disc of cartilage slightly larger than the tube to be inserted. The incision, unless unusually long, is not sutured. Drainage around the tube is important. Suturing causes more reaction and a tendency to emphysema. Experimental work (Richards & Glenn) has shown that this

type of opening does not interfere with the patency of the tracheal lumen after the tube is removed and healing has taken place. It seems illogical to insert a tube through a narrow transverse or longitudinal slit with the resultant tension on the margins of this slit. An adequate opening facilitates exchange of tubes with the least amount of irritation.

There seems to be a tendency to use too small a tube. Clinical observation indicates that the size of the lumen is not a factor in producing irritation in the trachea. In this respect only the length of the tube is important. The larger the lumen of the tube the less the tendency for it to clog with mucus to an extent to interfere with an adequate airway. A larger lumen is also easier to keep clean....

Nursing care by those experienced in the management of this type of care is extremely important.

Patients are surprisingly comfortable in permanent tracheotomy. Tracheitis and bronchitis are uncommon after the variable amount of this reaction present in the first few days after the operation. There seems to be no increased susceptibility to pneumonia. Thomson and Wood have each reported a case of tracheotomy tube worn over 70 years. Wood remarked that his patient claimed that she had never had bronchitis.

PROGRAM

INTERNATIONAL MEDICAL ASSEMBLY INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

October 18, 19, 20, 21, 22, 1937

ST. LOUIS, MISSOURI

MONDAY A. M.

Diagnostic Clinic: "Cosmetic Results in the Treatment of Cancerous Skin Lesions"—Dr. Joseph Eller, Professor of Clinical Dermatology and Syphilology, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Diagnostic Clinic: "Hypertensive Heart Disease, Manifestations, Diagnosis, Treatment"—Dr. Fred M. Smith, Professor of Theory and Practice of Medicine, State University of Iowa College of Medicine, Iowa City, Iowa.

Diagnostic Clinic: "Deficiency Diseases"—Dr. Russell L. Haden, Chief of Medical Division, Cleveland Clinic, Cleveland, Ohio.

Intermission to Review Exhibits

Diagnostic Clinic: "The Symptoms and Treatment of Injuries of the Spinal Cord"—Dr. Loyal Davis, Professor of Surgery, Northwestern University School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Types of Obesity and Their Treatment"—Dr. Reginald Fitz, Associate Professor of Medicine, Boston University Medical School, Boston, Mass.

Noon Intermission

Diagnostic Clinic: "Surgical Treatment of Peptic Ulcer"—Dr. Donald C. Balfour, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Ulcerative Colitis and Its Surgical Management"—Dr. Richard B. Cattell, Lahey Clinic, Boston, Massachusetts.

Address: "The Roentgen Treatment of Infections"—Dr. Frederick M. Hodges, Professor of Clinical Radiology, Medical College of Virginia, Richmond, Virginia.

Intermission to Review Exhibits

Address: "Meningitis Secondary to Disease of the Bones of the Skull"—Dr. Wells P. Eagleton, Newark, New Jersey.

Address: "The Treatment of Urinary Infections in Infants and Children"—Dr. John R. Caulk, Professor of Clinical Genito-Urinary Surgery, Washington University School of Medicine, St. Louis, Missouri.

Address: "Prenatal Care"—Dr. Otto H. Schwarz, Professor of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Missouri.

Address: "Granulomatous Lesions of the Intestines"—Dr. Claude F. Dixon, Assistant Professor of Surgery, University

of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Dinner Intermission

Address: "Recent Advances in the Field of Abdominal Surgery"—Mr. W. Hugh Cowie Romanis, F.R.C.S., Surgeon to St. Thomas Hospital, London, England.

Address: "The Influence of Drugs Upon the Physiology of the Failing Heart"—Dr. Maurice B. Visscher, Professor of Physiology and Head of the Department, University of Minnesota Medical School, Minneapolis, Minnesota.

Address: "The Mechanism and Treatment of Congestive Heart Failure"—Dr. Tinsley R. Harrison, Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee.

Address: "The Diagnostic Significance of Abdominal Pain"—Dr. Frederick J. Kaltefleiter, Clinical Professor of Medicine, Jefferson Medical College, Philadelphia, Pennsylvania.

Address: "Carcinoma of the Stomach"—Dr. Waltman Walters, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "Chronic Prostatitis"—Dr. Cyrus E. Burford, Professor of Urology, St. Louis University School of Medicine, St. Louis, Missouri.

TUESDAY A. M.

Diagnostic Clinic: "The Effects of General Infection on the Nervous System of Children"—Dr. Bronson Crothers, Assistant Professor of Pediatrics, Harvard University Medical School, Boston, Mass.

Diagnostic Clinic: "Spastic Paralysis"—Dr. Alan deForest Smith, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Diagnostic Clinic: "The Relation of Chronic Cystic Mastitis to Cancer of the Breast"—Dr. Dean Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Intermission to Review Exhibits

Diagnostic Clinic: "Pitfalls in the Diagnosis of Acute Abdominal Conditions"—Dr. Anton Ochsenr, Professor of Surgery, Tulane University of Louisiana School of Medicine, New Orleans, La.

Diagnostic Clinic: "Various Types of Edema and Their Treatment"—Dr. David P. Barr, Busch Professor of Medicine, Washington University School of Medicine, St. Louis, Missouri.

Noon Intermission

Diagnostic Clinic: "The Management of Compound Fractures of the Extremities"—Dr. John J. Moorhead, Professor of Clinical Surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Address: "Migraine"—Dr. Thomas Cecil Hunt, St. Mary's Hospital, London, England.

Address: "Cicatrizizing Enteritis—A Neglected Clinical Entity"—Dr. Elliott C. Cutler, Moseley Professor of Surgery, Harvard University Medical School, Boston, Mass.

Intermission to Review Exhibits

Address: "The Problem of Ocular Tuberculosis"—The Joseph Schneider Foundation Presentation—Dr. Alan C. Woods, Acting Professor of Ophthalmology, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Combined Abdomino-Perineal Resection for Carcinoma of the Rectum"—Dr. Thomas E. Jones, Cleveland Clinic, Cleveland, Ohio.

Address: "Early Diagnosis and Treatment of Cancer of the Cervix"—Dr. John R. Fraser, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.

Address: "General Consideration of Fractures of the Femur"—Dr. Marion L. Klinefelter, St. Louis, Missouri.

Dinner Intermission

Address: "Growth Disturbances of the Pelvis and Femur Resulting From Diseases of the Hip Joint"—Dr. Dallas B. Pehmister, Professor of Surgery, University of Illinois College of Medicine, Chicago, Illinois.

Address: "The Post Hoc Ergo Propter Hoc Fallacy in Medicine"—Dr. Robert D. Rudolf, Professor Emeritus of Therapeutics, University of Toronto Faculty of Medicine, Toronto, Canada.

Address: "Allergy as Related to the Otolaryngologist"—Dr. Harold G. Tobey, Boston, Massachusetts.

Address: "Newer Methods in the Medical Treatment of Peptic Ulcer"—Dr. Horace M. Soper, St. Louis, Missouri.

Address: "Subdural Hematoma"—Dr. Eric Oldberg, Professor of Neurology and Neurological Surgery, University of Illinois College of Medicine, Chicago, Illinois.

Address: "Toxemias of Pregnancy"—Dr. Nicholson J. Eastman, Professor of Obstetrics, Johns Hopkins University School of Medicine, Baltimore, Maryland.

WEDNESDAY A. M.

Diagnostic Clinic: "Hay Fever"—Dr. J. Harvey Black, Professor of Preventive Medicine, Baylor University College of Medicine, Dallas, Texas.

Diagnostic Clinic: "Newer Methods of Vascular Surgery"—Dr. Wayne Babcock, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Bronchiectasis and Certain Phases of Tuberculosis"—Dr. Charles R. Austrian, Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Intermission to Review Exhibits

Diagnostic Clinic: "Dyspepsia, Organic Reflex and Functional"—Dr. Walter C. Alvarez, Professor of Medicine, University of Minnesota, The Mayo Foundation, Rochester, Minn.

Diagnostic Clinic: "Syphilis of the Central Nervous System"—Dr. Leon H. Cornwall, Associate Professor of Neurology, Columbia University College of Physicians and Surgeons, New York, N. Y.

Noon Intermission

Diagnostic Clinic: "Abdominal Pain"—Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Kentucky.

Address: "Drugs in the Treatment of Heart Disease"—Dr. Robert L. Levy, Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, New York, N. Y.

Address: "Diagnosis and Treatment of Brain Abscess"—Dr. Walter E. Dandy, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: (Subject to be supplied)—Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minn.

Intermission to Review Exhibits

Address: "X-Ray Treatment of the Pituitary Gland"—Dr. Merrill C. Sosman, Assistant Professor of Roentgenology, Harvard University Medical School, Boston, Mass.

Address: "Water Balance in Surgical Patients With Special Reference to Pre- and Postoperative Management"—Dr. Frederick P. Collier, Professor of Surgery, University of Michigan Medical School, Ann Arbor, Michigan.

Address: "Anxiety States in General Practice"—Dr. William J. Kerr, Professor of Medicine, University of California Medical School, San Francisco, California.

Assembly Dinner

For Members of the Profession, Their Ladies and Friends
7:00 P. M.

Informal

Dr. John F. Erdmann, Master of Ceremonies.

Presentation of Token of Appreciation to Dr. George W. Crile, Cleveland, Ohio.

Addresses by eminent members of the profession and other distinguished citizens of the world.

THURSDAY A. M.

Diagnostic Clinic: "Cirrhosis of the Liver"—Dr. Charles A. Elliott, Professor of Medicine, Northwestern University School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Factors to be Considered in the Diagnosis of Diseases of the Genito-Urinary Tract"—Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Nephritis"—Dr. Jonathan C. Meakins, Professor of Medicine, McGill University Faculty of Medicine, Montreal, Canada.

Intermission for Review of Exhibits

Diagnostic Clinic: "Post-Operative Fistulae With Special Reference to the Gall-Bladder"—Dr. John F. Erdmann, Attending Surgeon, New York Postgraduate Hospital and Medical School, Columbia University, New York, N. Y.

Diagnostic Clinic: "The Relation of Diabetes to Arteriosclerosis"—Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, Mass.

Noon Intermission

Address: "A New Approach to the Treatment of Peptic Ulcer"—Mr. Wilson Hey, F.R.C.S., Surgeon, Manchester Royal Infirmary, Manchester, England.

Address: (Subject to be supplied)—Dr. William J. Mayo, Mayo Clinic, Rochester, Minn.

Address: "The Adherent Posterior Duodenal Ulcer"—Dr. J. William Hinton, Associate Professor of Clinical Surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Address: "The Prevention and Treatment of the Exanthemata"—Dr. John A. Toomey, Associate Professor of Pediatrics, Western Reserve University School of Medicine, Cleveland, Ohio.

Intermission to Review Exhibits

Address: "High Saphenous Ligations Plus Injection for Varicose Veins of the Leg"—Dr. William D. Haggard, Professor of Surgery, Vanderbilt University School of Medicine, Nashville, Tennessee.

Address: "Endocarditis"—Dr. Ralph A. Kinsella, Professor of Internal Medicine, St. Louis University School of Medicine, St. Louis, Missouri.

Address: "Recent Advances in Hormone Therapy as Applied to Gynecological Problems"—Dr. Emil Novak, Associate in Gynecology, Johns Hopkins University School of Medicine; Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore, Maryland.

Dinner Intermission

Address: "The Surgical Treatment of Diverticulitis"—Dr. Fred W. Rankin, Lexington, Kentucky.

Address: "Diagnosis and Treatment of Displacements of the Uterus"—Dr. William H. Vogt, Director of the Department of Gynecology and Obstetrics, St. Louis University School of Medicine, St. Louis, Missouri.

Address: "The Relation of the Development of the Child to the Endocrine System"—Dr. Charles R. Stockard, Professor of Anatomy, Cornell University Medical College, New York, N. Y.

Address: "Indications for Exploratory Laparotomy"—Dr. William T. Coughlin, Professor of Surgery, St. Louis University School of Medicine, St. Louis, Mo.

Address: "Tumors of the Kidney"—Dr. Herman L. Kretschmer, Clinical Professor of Surgery, Rush Medical College, University of Chicago, Chicago, Illinois.

FRIDAY A. M.

Diagnostic Clinic: "Surgical Lesions of the Common and Hepatic Ducts"—Dr. Frank H. Lahey, Director of Surgery, Lahey Clinic; Surgeon to the New England Baptist Hospital and the New England Deaconess Hospital, Boston, Mass.

Diagnostic Clinic: "The Diagnosis and Management of Cardiac Arrhythmias"—Dr. Roy W. Scott, Professor of Clinical Medicine, Western Reserve University School of Medicine, Cleveland, Ohio.

Diagnostic Clinic: "Chest Surgery"—Dr. Evarts A. Graham, Bixby Professor of Surgery, Washington University School of Medicine, St. Louis, Missouri.

Intermission to Review Exhibits

Diagnostic Clinic: "The Medical Treatment of Arthritis"—Dr. Cyrus C. Sturgis, Professor of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Diagnostic Clinic: "Diagnosis and Management of Diseases of the Thyroid Gland"—Dr. George Crile, Cleveland Clinic, Cleveland, Ohio.

Noon Intermission

Address: "The Surgical Treatment of Arthritis"—Dr. Philip D. Wilson, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Address: "Diet of Infants"—Dr. Charles Hendee Smith, Professor of Pediatrics, University and Bellevue Hospital Medical College, New York, N. Y.

Address: "The Relation of the Pituitary, Thyroid, Adrenals, Liver, and Pancreas to Hyperinsulinism and Spontaneous Hypoglycemia"—Dr. Seale Harris, Professor Emeritus of Medicine, University of Alabama School of Medicine, Birmingham, Alabama.

Address: "Relief of Intractable Pains by Subarachnoid Alcohol Injections, Nerve Blocks, Root Sections, and Chordotomy"—Dr. W. McK. Craig, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Foundation, Rochester, Minnesota, and Dr. Alfred W. Adson, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine; Senior Neurosurgeon of Mayo Clinic, Rochester, Minnesota.

Intermission to Review Exhibits

Address: "Diagnosis and Treatment of Pneumonia"—Dr. Russell L. Cecil, Professor of Internal Medicine, New York Polyclinic Medical School and Hospital, New York, N. Y.

Address: "The Significance of Hoarseness and Local Discomfort in Laryngeal Disease"—Dr. Gabriel Tucker, Professor of Clinical Bronchoscopy and Esophagoscopy, University of Pennsylvania School of Medicine and Professor of Bronchoscopy and Laryngeal Surgery, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa.

Address: "The Surgery of Hermaphroditism and Associated Adrenal Diseases"—Dr. Hugh H. Young, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "The Menace of Post-Operative Adhesions"—Dr. Fred W. Bailey, St. Louis, Missouri.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary
St. Paul, Minnesota

DOCKET OF CASES

STATE OF MINNESOTA *versus* VIVI ANN WYN-TOR, also known as VIVI ANN MIELKE.

On July 12, 1937, Judge Richard D. O'Brien of District Court made an order overruling the demurrer interposed by the defendant in the above case. Judge O'Brien has certified the legal question involved to the State Supreme Court for final decision. By demurrer, the defendant has admitted the facts of the charge, but holds that they do not violate the laws of Minnesota. Mrs. Wyntor, 24, claims she is a staff lecturer for an osteopath, R. A. Richardson, of Kansas City, Missouri; and she was arrested on April 23, 1937, charged with practicing healing without a basic science certificate. On the last day of her so-called "health lectures" at the Lowry Hotel in St. Paul, she offered certain products for sale. She was also recommending rectal dilators and colonic irrigation apparatus. On being arraigned in court, she posted a bond of \$500.00. She is represented by State Senator George H. Lommen, of Eveleth, Minnesota.

Julian F. DuBois, M.D., secretary of the Minnesota State Board of Examiners, asks every physician to watch for one Ramon L. de Silvio, a Negro, who has been representing himself as a physician in the northern part of Minnesota. De Silvio has served six months of a sentence of one year in the St. Louis County Work Farm at Duluth; and was arrested in San Jose, California, in 1932, for violating the medical practice act. If De Silvio is found, the Minnesota State Board of Medical Examiners, 524 Lowry Medical Arts Building, St. Paul, Minnesota, should be notified. Telephone: CEDAR 2064.

The license of Dr. David Hamilton Nusbaum, 81, Jackson, Minnesota, has been revoked by the Minnesota State Board of Medical Examiners, for conviction by the District Court (4th division) on March 19, 1937, of violating the Harrison Narcotic Act. He was graduated from Western Reserve University in 1885, and licensed in Minnesota in 1910. The Board has also revoked the license of Dr. Walter Bertram Clement, 30, of Shakopee, Minnesota, for "immoral, dishonorable, and unprofessional" conduct following the death of a 24-year-old St. Paul girl on May 19, 1937. Dr. Clement was graduated from the University of Colorado in 1934, licensed in Minnesota in 1935.

STATE OF MINNESOTA *versus* A. C. MARTIN:

On July 27, 1937, one A. C. Martin, 54, pleaded guilty to information charging him with practicing healing with no basic science certificate. He was thereupon sentenced by Judge Joseph J. Moriarty, of Shakopee, to pay a fine of \$200.00 and costs of \$9.85 or serve one year in the McLeod County jail at Glencoe. He stated he would pay the fine and costs. Martin had been making trips to Brownton, where he had a room at a hotel, for the purposes of receiving patients. He tried to treat goiter and glandular conditions, and also did some massage. He claimed to have lived for many years in Martin County, and for two years in Mankato. The Minnesota State Board of Medical Examiners received first-class coöperation from Mr. Joseph P. O'Hara, of McLeod County, and from Mr. Alfred Beihoffer, sheriff of McLeod County.

RESOLUTION

**By the North Dakota State Medical Association
Concerning U. S. Senator Lewis's Plan for Federalized
Medical Aid**

At a meeting of the Executive Committee of the North Dakota State Medical Association, August 1937, there was considered the speech of United States Senator J. Hamilton Lewis of Illinois delivered before the House of Delegates of the American Medical Association at the sessions held in Atlantic City June 10th, 1937; and also there was discussed Senate Joint Resolution 188 introduced by Senator Lewis apparently with the definite object of compelling all physicians and surgeons to become civil officers of the federal government, and imposing a heavy fine upon and imprisonment of any doctor refusing to render professional aid to any indigent person.

The consensus of medical opinion in this State definitely opposes any such compulsory regimentation of any body of its citizens except in direct national emergency.

This proposal violates all of the precepts that the medical profession holds essential for the best care of the sick. It would burden the competent physicians beyond physical endurance, and because of the excessive burden of the indigents, forced upon the more competent practitioners, the honest, thrifty taxpaying middle class would necessarily suffer. The demands of the indigent, and especially of a certain type, are so notoriously known to exceed reason that this feature would require of itself an army of social workers to keep their demands within bounds. This would be only another step towards building up an enormous bureaucracy controlled by the dominant political party.

The medical profession of this State has shown its willingness to coöperate with the governmental agencies, both local and federal, in supplying emergency medical care to its indigents on a fee scale far lower than the actual costs of such care, during the past years of droughts and depressions. And over and above all of these cases, in all past years the majority of physicians and surgeons have given freely and gratis their professional services to very many persons not coming within the scope of governmental relief. It stands ready again to continue such services, but it feels that the plan proposed by Mr. Lewis denies the right of individual prerogative to such an extent that the individual is reduced to practical serfdom.

News Items

Dr. Frederick C. Drenning, 69, of Duluth, Minnesota, died at Duluth on July 25, 1937, of a heart attack.

A two-story stucco hospital costing \$14,000 will be erected at Watford City, North Dakota.

Dr. Thomas Horatius Baer, Timber Lake, South Dakota, has been appointed Dewey County physician.

Dr. Theodore Robert Schweiger, of the Morsman Clinic in Hibbing, Minnesota, has located with the Morsman Clinic in Grand Rapids.

Dr. Charles W. Bray, 69, of Biwabik, Minnesota, a past president of the Northern Minnesota Medical Association, died on July 7, 1937, of heart failure.

Ernest LeRoy Grinnell, M.D., former mayor of Aneta, North Dakota, has joined the Healy, Law & Moore Clinic in Grand Forks.

Dr. Albert S. Rider, Flandreau, South Dakota, is the new member of the South Dakota State Planning Board, succeeding Dr. Park B. Jenkins, of Pierre.

Dr. Paul E. Kenyon, of Wadena, Minnesota, a graduate of the Northwestern University Medical School in 1896, has retired, and will go South with Mrs. Kenyon.

Dr. Walter Clinton Jump, of Madison Lake, Minnesota, has taken over the practice of Dr. Frank D. Smith, Kasson, Minnesota. Dr. Smith has moved to Rochester.

Dr. Roy G. Swenson, Harris, Minnesota, has purchased the practice of Dr. Gregor Elmer Schoofs, of North Branch, and will locate there.

Dr. J. L. Conrad, of Jamestown, North Dakota, is the new president of the Stutsman County Medical Society. He was formerly its secretary.

The new Hodgkin Medical Clinic at Kalispell, Montana, owned by Dr. W. E. Hodgkin and costing \$10,000, will open about December 1, 1937.

Dr. Robert Joseph Quinn, of Burke, South Dakota, has been appointed to the South Dakota State Board of Health, to serve until July, 1942.

Dr. Edwin Marius Howg, of Lennox and Humboldt, South Dakota, has located at Canova. His office will be in the Canova Hospital.

The 15th annual meeting of the American Academy of Physical Medicine will be held in Philadelphia on October 19, 20, and 21, 1937.

Dr. Oswald W. Katz, who formerly practiced at Hartford, South Dakota, has returned to Faulkton to open offices in the First National Bank Building.

Dr. Charles Milton Clark, 47, who was associated with the Mayo Clinic from 1915 to 1920, died at Akron, Ohio, on July 21, 1937.

Dr. Clyde H. Frederickson, of the Great Falls Clinic in Great Falls, Montana, is now associated with the Western Montana Clinic in Missoula.

Dr. Donald Kay Bacon, St. Paul, Minnesota, has been invited to address the International Congress on Blood Transfusion at Paris, France, September 29 to October 3, 1937.

Dr. Wilbert William Yaeger, Ivanhoe, Minnesota, has sold his practice to Dr. Alvin Erickson, of Sanborn, Minnesota. Dr. Erickson has moved to Ivanhoe.

Dr. Walter Henry Valentine, of Tracy, Minnesota, will offer bonds to the amount of \$75,000 to build a modern 30-bed hospital in Tracy.

Dr. William Gustav Rogne, formerly of McClusky, North Dakota, has associated with Doctors Gustav M. and John William Helland at Spring Grove, Minnesota.

Dr. John A. Paulson, a recent graduate of the University of Minnesota Medical School, has located at 3½ South Broadway in Rochester, Minnesota.

Dr. Harry A. Palmer, who has completed his internship at Saint Luke's Hospital in Duluth, Minnesota, has located at Virginia in the City Drug Store building.

The Upper Mississippi Valley Medical Society met at Cass Lake, Minnesota, on July 31. About 100 physicians and their wives were present.

Dr. Johan Martin Arnson, of Benson, Minnesota, has been designated school physician by the Benson Board of Education.

The Bowbells Civic Club, of Bowbells, North Dakota, arranged to have Dr. Robert T. St. Clair, of Minot, open an office in the Bowbells City Hospital on July 15.

Dr. A. W. Pearson, formerly of Minneapolis, and a former student in the University of Minnesota Medical School, is now located at 307 East Manchester Boulevard in Inglewood, California.

Dr. Ralph K. Ghormley, Rochester, Minnesota, associate professor of orthopedic surgery in the University of Minnesota Graduate School of Medicine, is the new secretary of the American Orthopedic Association.

Dr. Edward John Zeiss, of Wildrose, North Dakota, has received an appointment as resident physician in the Cook County Hospital in Chicago, to commence on January 1, 1938.

Dr. Carl Abraham Fjelstad, Minneapolis, who was graduated from the University of Minnesota Medical School in 1892, is the new house physician at Mudbaden Sanitarium, near Jordan, Minnesota.

Dr. Joseph Francis Malloy, a graduate of the Creighton University Medical School in 1921, has left Mitchell, South Dakota, to become a member of the staff of the Bratrud Clinic in Thief River Falls, Minnesota.

Dr. Grant F. Hartnagel, who recently completed his internship at the Milwaukee County General Hospital in Wauwatosa, Wisconsin, has located in Red Wing, Minnesota, in the office of Dr. Edward Henry Juers.

Dr. Henry E. Rokala, who recently completed his internship at St. Luke's Hospital in Duluth, Minnesota, has become a member of the staff of Biwabik Hospital, Biwabik.

Dr. Charles Gordon Uhley, a graduate of the University of Minnesota Medical School in 1933, has been added to the surgical staff of the Northwestern Clinic in Crookston, Minnesota.

Dr. Rush Leslie Burns, for 22 years a surgeon in Two Harbors, Minnesota, has sold his interest in the Burns-Christensen Hospital to Dr. Edward E. Webber, of Duluth. Dr. Burns has gone to California.

Dr. Carl Blotner, Charlottesville, Virginia, a graduate of the St. Louis University School of Medicine in 1933, is the new associate medical officer of the Cheyenne River Indian Agency in South Dakota.

Dr. Benson Scodel, a graduate of Tufts University School of Medicine, Boston, Massachusetts, in 1921, has located at Maynard, Minnesota, in the telephone building.

The new \$2,500,000 asylum for the insane at Moose Lake, Minnesota, is expected to open shortly after January 1, 1938, according to John Foley, chairman of the Minnesota State Board of Control.

Dr. George Alfred Dodds has been appointed superintendent of the North Dakota State Tuberculosis Sanatorium at San Haven by the State Board of Administration, for a 2-year term.

The Association of Military Surgeons of the United States will hold its 45th annual convention at Los Angeles on October 14, 15, and 16, 1937. Rear Admiral P. S. Rossiter, M.D., U. S. Navy, is president.

The annual meeting of the Mississippi Valley Medical Society will be held on September 29 and 30 and October 1, 1937, at Lincoln-Douglas Hotel, Quincy, Illinois, with 60 lectures and 48 teachers and clinicians.

Dr. Clarence George Owens, a graduate of the University of Minnesota Medical School in 1930, has associated with Dr. John Douglas Graham, in the World Building at Devil's Lake, North Dakota.

Dr. William Cyril Ferguson, formerly of the Northern Pacific Hospital in Fargo, North Dakota, has purchased the practice of the late Dr. Earl Jamieson of Walnut Grove, Minnesota.

Dr. Irving W. Kellogg, of Perris, California, a graduate of the College of Medical Evangelists at Los Angeles in 1931, has taken over the practice of Dr. Albert H. Reiswig, of Fairmount, North Dakota.

Dr. Kasper P. Caveny, a recent graduate of the University of Minnesota Medical School, has completed his internship at Bethesda Hospital in Saint Paul, and has located in Elkton, South Dakota.

Dr. David J. Almas, a graduate of the University of Minnesota Medical School, finished his internship at Ancker Hospital in Saint Paul, and has located at Havre, Montana, above the Owl Drug Company's store.

Dr. Ivar Sivertsen, of Minneapolis, a member of the Minnesota State Board of Medical Examiners, has been given the Order of Saint Olaf by King Haakon of Norway.

Dr. Hazel Reed, a graduate of the University of Colorado School of Medicine in 1917, will leave Grass Range, Montana, to practice medicine at Stanford in Judith Basin County.

Dr. Arthur LeRoy Jones, 42, of Gregory, South Dakota, died in August of a heart attack. He was a graduate of the University of Iowa College of Medicine in 1922.

Dr. August C. Orr, of the State Public Health Department, conducted a pre-school clinic in the basement of the Mandan Memorial Building at Mandan, North Dakota, during the week of August 16, 1937.

Silver Bow County in Montana now has a well-equipped laboratory for public health work, as a result of the work of the Butte Junior Service League, which donated the equipment.

Dr. Fred Lowe has obtained the practice of the late Dr. D. Euclide Rainville in Boulder, Montana, and will occupy offices in the bank building where Dr. Rainville practiced.

Dr. Thomas Cruickshank, instructor in medicine in the University of South Dakota at Vermillion, and a graduate of the old Barnes Medical College in St. Louis in 1899, has retired after 38 years of practice.

Dr. William Frank Sercl, a graduate of the University of Nebraska College of Medicine in 1932, has located in the Sioux Falls Clinic Building in that South Dakota city, to specialize in obstetrics and gynecology.

Dr. Martin Joseph Fiala, 34, of Duluth, Minnesota, died on August 9, 1937, at Rochester, Minnesota, of a brain tumor. He was a member of the Minnesota Urological Association.

Dr. Emil Theodore Keller, of Leola, South Dakota, a graduate of the University of Minnesota Medical School in 1936, has joined the staff of the new Rood Hospital in Chisholm, Minnesota.

Dr. William Gerard Paradis, since 1929 medical director of Sunnyrest Sanatorium at Crookston, Minnesota, has resigned to enter private practice at Canton, Ohio.

Dr. Pearl V. Matthaei, formerly of the staff of the State Hospital for the Insane at Jamestown, North Dakota, has resigned to go to her home at Great Bend, Kansas.

Ralph Edward Mahowald, A.B., S.B., M.D., a graduate of Rush Medical College of the University of Chicago in 1936, will take over the practice of the late Thomas Mulligan at Grand Forks, North Dakota.

Dr. John Joseph Mertens, Gettysburg, South Dakota, a graduate of the old College of Physicians & Surgeons in Minneapolis in 1903, has been elected a life member of the Potter County Historical Association.

Dr. Edward W. Fahey, St. Paul, was elected supreme physician of the Knights of Columbus at the 55th international convention held recently at San Antonio, Texas.

Dr. John R. Thompson, 79, pioneer South Dakota physician and a past president of the South Dakota State Medical Association, died at his home in Northville on August 24, 1937.

Dr. John Walter Williams, 52, Minneapolis, a graduate of the old Minneapolis College of Physicians & Surgeons in 1907, died near Brainerd, Minnesota, on August 22, of a heart attack. Captain Williams was flight surgeon of the 109th aero squadron, Minnesota National Guard.

Dr. Frank Benjamin Hicks, 76, a graduate of the Rush Medical College of the University of Chicago in 1899, died at University Hospital in Minneapolis on August 21, 1937. He founded the First Congregational Church in Grand Marais, Minnesota, and was the first physician to open an office in Cook County, Minnesota.

Dr. Harry A. Palmer, a recent graduate of the University of Minnesota School of Medicine, has opened offices above the City Drug Store in Eveleth, Minnesota.

Dr. George H. Purves, of Russell, Minnesota, has purchased the practice of Dr. Peder J. Bursheim, Lake Benton. Dr. Bursheim will go to Atlantic, Iowa, to enter the drug business of his son.

Dr. Samuel Leonard, a graduate of the University of Minnesota Medical School in 1930, is leaving Minneapolis to do post-graduate surgical study at Cook County Hospital in Chicago.

Dr. Stuart W. Harrington, Rochester, Minnesota, professor of surgery in the University of Minnesota Graduate School of Medicine, is the new president of the American Society for Thoracic Surgery.

Orthopedic surgeons in North Dakota have examined no less than 831 crippled children under the auspices of Elks Clubs and state child service agencies, according to Mr. E. A. Willson, executive director of the State Public Welfare Board.

Dr. John C. Wilkinson, 65, a graduate of the University of Iowa College of Medicine in 1896, who left Red Lake Falls, Minnesota, in 1922, died recently at Gatun, Canal Zone, where he had been in government service.

Dr. Karl Eugene Sandt, a graduate of the University of Minnesota Medical School in 1935, has completed his internship at the Manhattan Eye, Ear & Throat Hospital in New York City, and has located at Osseo, Minnesota, with Dr. Kenneth J. St. Cyr.

Dr. Louis H. Fligman, Helena, Montana, four times president of the Montana State Board of Health, and a board member since 1919, has been reappointed by Governor Roy E. Ayers. Dr. Fligman was president of the Medical Association of Montana in 1936.

Dr. John Luverne Mulder, a graduate of the University of Minnesota Medical School in 1919, has sold his practice and equipment at Cavalier, North Dakota, to Dr. Henry Mitchell Waldren, Dr. Henry Mowat Waldren, and Dr. George Richard Waldren.

Dr. Jay M. Cook, Staples, Minnesota, a graduate of the Creighton University School of Medicine in 1922, is the president of the staff of the new Staples Municipal Hospital. Dr. Werner J. Lund is vice-president; and Dr. Charles F. Reichelderfer is secretary.

Dr. Gerald John van Heuvelen, of the South Dakota State Board of Health, addressed the final spring-summer meeting of the Seventh District Medical Society (South Dakota) at Sioux Falls on "The Control of Venereal Diseases."

Dr. John Lucian Calene, F.A.C.S., of Aberdeen, South Dakota, a graduate of Rush Medical College of the University of Chicago in 1921, has been elected to the board of governors of the American College of Physicians, to represent South Dakota.

Dr. Hans M. Lichtenstein, 70, a graduate of the University of Tubingen (Germany) in 1888, and a member of the Winona County Medical Society in Minnesota since 1894, died on August 6 at Colonial Hospital in Rochester.

Dr. B. L. Pampel, Livingston, Montana, was elected president of the Montana State Board of Health on August 12, at Helena. Dr. Enoch M. Porter, Great Falls, was elected vice president. Dr. L. H. Fligman, of Helena, is the retiring president.

Dr. James Harold Drake, of International Falls, Minnesota, a graduate of the Chicago Homeopathic Medical College in 1902, was elected surgeon of the Minnesota department of Veterans of Foreign Wars at the annual encampment at Chisholm.

Dr. Albert Eric Olson, of West Duluth, Minnesota, and a member of the Board of Regents of the University of Minnesota, was elected to the Saint Louis County Sanatorium Commission to succeed Dr. E. L. Tuohy, Duluth, who had held the post for 30 years.

Dr. Eugene B. Hultz, Hill City; Dr. Albert A. Heinemann, Wasta; Dr. Norris Tillman Owen and Dr. Stanley Owen, both of Rapid City; have been hired by Pennington County in South Dakota to give medical care to indigent patients.

Dr. Frank James Bickford, 67, of Centralia, Washington, died in that city on July 22. Dr. Bickford was graduated from the University of Minnesota Medical School in 1902, and for a time practiced in Pine River, Minnesota. He went to Centralia in 1910.

Dr. Earl Jamieson, 60, of Walnut Grove, Minnesota, died on July 17, 1937, of meningitis following a nasal operation. He was graduated from the University of Illinois College of Medicine in 1908. He was buried at Mankato.

Dr. Joseph Lorin Mondloch, Butte, Montana, county physician for Silver Bow County, conferred with the State Board of Health at Helena on August 12, relative to the vaccination of school children for smallpox in Butte and Anaconda.

Dr. Thomas Parran, Jr., surgeon-general of the United States Public Health Service at Washington, visited the Rocky Mountain Public Health Service Laboratory at Hamilton, Montana, on August 10. He was the guest of the Hamilton Lions Club that evening.

Dr. Carl M. Anderson, 55, assistant professor of otolaryngology in the University of Minnesota Graduate School of Medicine, and a member of the section on otolaryngology and rhinology of the Mayo Clinic, died at Rochester on August 10, 1937, of coronary thrombosis.

Dr. G. Harmon Brunner, a graduate of the University of Colorado School of Medicine in 1928, and formerly resident physician at the Illinois Eye & Ear Infirmary in Chicago, has joined the staff of Dr. Archie D. McCannel and Dr. C. R. Kempthorne, in Minot, North Dakota.

The broadcast of the Minnesota State Medical Association for September is as follows: 4th, "Diphtheria & Smallpox"; 11th, "Duodenal Ulcer"; 18th, "Insomnia"; 25th, "Cancer of the Mouth." Dr. Frederick A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota, will speak. Station WCCO (810 kilocycles, 370.2 meters); 9:45 a. m. each Saturday.

The North Dakota Department of Public Health is cooperating with Surgeon-General Thomas Parran, Jr., in trying to stamp out syphilis and gonorrhea, reports Dr. Maysil M. Williams, director. Dr. John A. Cowan, state epidemiologist, has been lecturing throughout the state on the subject.

Dr. Frank C. Rodda, clinical professor of pediatrics, and Dr. Vernon L. Hart, instructor in orthopedic surgery, both of the University of Minnesota Medical School, spoke before the Upper Peninsula Medical Society at Houghton, Michigan, on August 19 and 20, 1937.

Dr. Harry B. Fralic, 56, who was medical director of the Veterans' Administration Facility at Fort Snelling, Minnesota, from 1927 until August 1932, died at St. Petersburg, Florida, on August 12, 1937. From 1922 until 1926 he was medical director of the old Aberdeen Hospital for veterans in St. Paul. He was graduated from the Medico-Chirurgical College of Philadelphia in 1905.

The bid of \$159,175.00 of Henry H. Hackett, of Rapid City, South Dakota, for construction of an addition to the Hospital No. 12 of the Veterans' Facility at Hot Springs, South Dakota, has been accepted by the Veterans' Administration. The bid of H. B. Kilstofte, of Winona, Minnesota, of \$30,000.00 for the alteration and addition to a hospital at Fort Snelling, Minnesota, has been accepted by the War Department.

Dr. Albert E. Meinert, Winona, Minnesota, was elected president of the Southern Minnesota Medical Association at the annual meeting on board the steamboat *Capitol* on August 11, 1937. Dr. W. A. Fansler, Minneapolis, assistant professor of surgery (proctology) in the University of Minnesota Medical School, was elected 1st vice president; Dr. Albert Fritsche, New Ulm, was selected 2nd vice president; and Dr. Nelson W. Barker, Rochester, assistant professor of medicine in the University of Minnesota Graduate School of Medicine, was elected secretary-treasurer.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON JUNE 29, 1937 (BY EXAMINATION)

Name	School	Address
Aldes, John Henry	U. of Minn., M.B., 1937	St. Joseph's Hospital, St. Paul, Minn.
Beckjord, Philip Rains	U. of Minn., M.B., 1937	317 S. E. Union St., Minneapolis, Minn.
Boraas, John Albert	U. of Minn., M.B., 1936	Ada, Minn.
Butler, John Kenneth	U. of Minn., M.B., 1936	Belle Plaine, Minn.
Cherry, James Henderson	Duke U., M.D., 1933	Co. 2703, C.C.C., Park Rapids, Minn.
Crago, Felix Hughes	Duke U., M.D., 1935	University Hospital, Minneapolis, Minn.
Donath, Douglas Harry	U. of S. Cal., M.D., 1936	Mayo Clinic, Rochester, Minn.
Erickson, Ralph Edward	U. of Minn., M.B., 1936	5128 31st Ave. S., Minneapolis, Minn.
Evans, Charles Albert	U. of Minn., M.B., 1936	427 8th Ave. S. E., Minneapolis, Minn.
Grant, Russel	U. of Minn., M.B., 1937	Hackensack Hospital, Hackensack, N. J.
Hanson, Harry Albert	U. of Minn., M.B., 1937	Rochester Gen. Hospital, Rochester, N. Y.
Haury, Victor Givens	U. of Minn., M.B., M.D., 1935	3430 Warden Drive, Philadelphia, Pa.
Heilman, Dorothy Marg't Henderson	Northwestern, M.B., 1931, M.D., 1932	Mayo Clinic, Rochester, Minn.
Hilger, Jerome Andrew	U. of Minn., M.B., 1936	1941 Selby Ave., St. Paul, Minn.
Hilger, Laurence David	U. of Minn., M.B., 1936	1941 Selby Ave., St. Paul, Minn.
Jaack, James Lyman	U. of Minn., M.B., 1936	401 Cedar Ave., Minneapolis, Minn.
Koch, Ferdinand Leonard Philip	Johns Hopkins, M.D., 1933	Mayo Clinic, Rochester, Minn.
Lindblom, Alton Edwin	U. of Minn., M.B., 1936	4344 Lyndale Ave. S., Minneapolis, Minn.
Maun, Mark Emmett	Northwestern, M.B., 1936, M.D., 1937	Ancker Hospital, St. Paul, Minn.
Maves, Robert Arthur	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Moos, Daniel James	U. of Minn., M.B., 1937	1021 E. River Road, Minneapolis, Minn.
Nelson, Kenneth L.	U. of Minn., M.B., 1936	Willmar Clinic, Willmar, Minn.
Nelson, Lloyd Joseph	U. of Minn., M.B., 1936	Mpls. General Hospital, Minneapolis, Minn.
Nessa, Curtis Blaine	U. of Minn., M.B., 1936	801 E. River Road, Minneapolis, Minn.
Olson, Duane Oliver Chas.	U. of Minn., M.B., 1937	Mpls. General Hospital, Minneapolis, Minn.
Potter, Robert B.	U. of Minn., M.B., 1936	Hendricks, Minn.
Pumphrey, Robert Earl	Ohio State U., M.D., 1930	Mayo Clinic, Rochester, Minn.
Rademaker, William	U. of Minn., M.B., 1935, M.D., 1936	Evansville, Minn.
Schuele, David Thaddeus	U. of Wis., M.D., 1936	Ancker Hospital, St. Paul, Minn.
Sinclair, James William	U. of Toronto, M.D., 1933	74 Bingham St., Kitchener, Ont., Canada
Sprafka, Ambrose Edward	U. of Minn., M.B., 1936	St. Anthony de Padua Hosp., Chicago, Ill.
Walsh, Francis Mark	U. of Minn., M.B., 1937	4037 Garfield Ave. S., Minneapolis, Minn.
Welton, Philip Charles	Marquette U., M.D., 1937	Nopeming, Minn.
Yaffe, Henry Irvin	U of Minn., M.B., 1934, M.D., 1936	610 Logan Ave. N., Minneapolis, Minn.

BY RECIPROCITY

Beech, Raymond Henry	Northwestern, M.D., 1933	E. 7th and Minnehaha Sts., St. Paul, Minn.
Dworak, Arthur Francis	Creighton U., M.D., 1930	Walker, Minn.
Northrop, Cedric	U. of Ore., M.D., 1936	Glen Lake San., Oak Terrace, Minn.
Sheedy, Leo Patrick	Geo. Wash. U., M.D., 1933	Mayo Clinic, Rochester, Minn.

BY NATIONAL BOARD CREDENTIALS

Adams, John Milton	Columbia, M.D., 1933	1009 Nicollet Ave., Minneapolis, Minn.
Miller, Donald Frank	Northwestern, M.D., 1933	Williamsburg, Iowa
Patton, George DuBarry	Temple University, M.D., 1935	Mayo Clinic, Rochester, Minn.
Uhley, Charles Gordon	U. of Minn., M.D., 1933	Crookston, Minn.

Book Notices

CHILD PSYCHIATRY

Our Children in a Changing World, by ERWIN WEXBERG, M.D., and Henry E. Fritsch; 1st edition, cloth, 232 pages; The Macmillan Company, New York: 1937. Price, \$2.00.

When one is confronted with the task of reviewing another one of those books on child psychology, one wonders whether anything new or useful can be learned. But after wading through the pages of *Our Children in a Changing World*, the reviewer feels well-paid for his time. For the authors have emphasized and consistently developed the point of view of individual psychology, which is still too often neglected by physicians as well as parents. They stress the point that there are no "bad" children—that the final pattern of personality is the result of the welding of the inherent instincts and abilities with the educational influences to which the child is exposed. In other words, a child becomes what he is in accordance with the things that happen to him after he is born, and before he becomes an adult. This point of view offers the best practical means of preventing and treating the common behaviour disorders in childhood.

The material first includes the environmental factors that are responsible for maladjustment in children. (1) The physical condition of the child, (2) the social and economic influences, (3) sex, (4) the family and (5) education. Next he presents much varied clinical material in behalf of the criminal, lying, fearful, and lazy child. The last chapter on education and corrective measures sums up the educational task for the parent in a concise, practical way.

There are only two criticisms which the reviewer believes should be made, both of minor importance (1) the word *inferiority* appears too frequently and (2) a book that presents the biological point of view should give more consideration to the physiology of behaviour.

The author is professor of neuro-psychiatry in the Louisiana State University.

COUNTRY DOCTOR'S SAGA

Dr. Betterman's Diary, by AMOS BETTERMAN, M.D., edited by CHARLES ELTON BLANCHARD, M.D.; 2nd edition, black fabrikoid, 278 pages, illustrated; Youngstown, Ohio: The Medical Success Press: 1937. Price, \$3.00.

This is the second edition of a work first published in 1933. It concerns the years shortly after the Civil War, and extends well up to what we consider the modern age. The author wrote with a saltiness and a pith that is at once apparent in every page. He was born in 1825 and died in 1910.

REGIONAL ANATOMY TEXT

Regional Anatomy, by J. C. HAYNER, B.S., M.D.; 1st edition, dark blue cloth, 634 pages plus index, no illustrations, gold-stamped; Baltimore, Maryland: William Wood & Company: 1935. Price, \$6.00.

DR. HAYNER, who is associate professor of anatomy and assistant surgeon of the Flower Hospital in New York City, has written a text essentially for students in anatomy. This volume does not attempt to displace the customary surgical anatomy; but it does recognize that many so-called "regional anatomies" have actually been surgical anatomy texts. Professor HAYNER takes the position that the purely descriptive anatomy must be thoroughly mastered before pathological anatomy can be attempted; and with this viewpoint THE JOURNAL-LANCET is in accord.

The book is well-printed and handsomely bound. While it is "a hand-maiden to other books on anatomy," its concision and accuracy recommend it highly.

NORTH DAKOTA MEDICINE

North Dakota Medicine: Sketches & Abstracts, by JAMES GRASSICK, M.D.; 1st edition, brown fabrikoid, gold-stamped, 365 pages plus index, illustrated; Fargo: The North Dakota State Medical Association: 1926. Price, \$2.25, postpaid from ALBERT W. SKELSEY, M.D.

This volume was presented to the library of THE JOURNAL-LANCET by the North Dakota State Medical Association, and is greatly appreciated. A vast amount of personal labor has gone into it. Dr. Grassick's work is evident on every page, particularly in the very valuable roster of physicians in Dakota territory from 1885 to 1890. The sketches are excellently done and are, withal, highly interesting, even to one who knows nothing of North Dakota history. This is a venture which should have been undertaken by every state medical association, but which actually has been done, to our knowledge, by very few. The North Dakota State Medical Association is to be congratulated, and the work of Dr. GRASSICK should be in the possession of every North Dakota physician. It is said that only a few copies remain with Dr. SKELSEY.

FOR THE PHYSICIAN-PRESCRIBER

Remington's Practice of Pharmacy, by E. FULLERTON COOK, P.D., Ph.M., CHARLES H. LA WALL, Ph.M., Pharm. D., Sc.D., and others; 8th edition, heavy cloth, 2,162 pages, 702 illustrations; Philadelphia: The J. B. Lippincott Company: 1936. Price, \$10.00.

It is a surety that no men other than the authors could have been chosen with such felicity for the task of revising REMINGTON's standard text on pharmaceutical practice. Doctor COOK is chairman of the Committee of Revision of the Pharmacopoeia of the United States, and Doctor LA WALL is dean of pharmacy in the Philadelphia College of Pharmacy and Science.

This particular revision was imperative, since the Eleventh Edition of the *U. S. Pharmacopoeia* appeared in June 1936, and the *National Formulary*, 6th edition, and the American Medical Association's *New and Non-Official Remedies* both came out during 1936. This edition of REMINGTON is therefore revised to include revisions in the texts named above.

This is a very good volume for those physicians who still prescribe and fill their own prescriptions. Not many are left; yet those who do remain have a definite need for such a work. There is a good chapter on glandular products, and a new section on hospital pharmacy. In spite of the frequent typographical errors, THE JOURNAL-LANCET recommends this work as an invaluable addition to pharmaceutical literature.

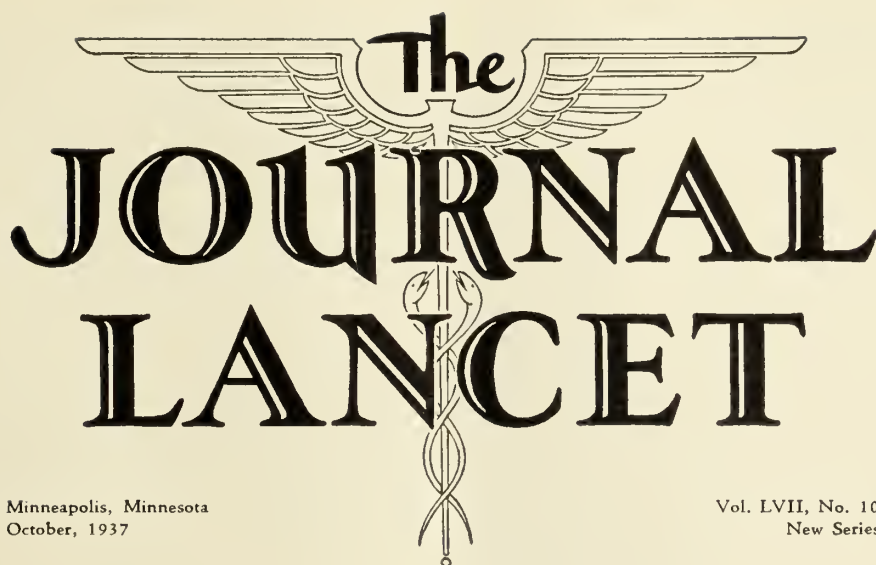
PHYSICIAN'S LABORATORY SYPHILIS MANUAL

The Laboratory Diagnosis of Syphilis, by HARRY EAGLE, M.D., with an introduction by JOSEPH EARLE MOORE, M.D.; 1st edition, blue cloth, dark blue cloth, gold-stamped, 377 pages plus appendices, references and index, 27 illustrations; St. Louis: The C. V. Mosby Company: 1937. Price \$5.00.

This book is quite opportune at the present time, when so much work and thought are centered on the diagnosis and control of syphilis. The author has dealt in detail with the various serologic tests, their variations and their interrelationship with each other as well as their relationship to the clinical manifestations.

The chronological classification of tests with the various modifications of the original serologic tests from BORDET and WASSERMANN up to the present time are listed, and their various techniques dealt in detail.

The bibliography is voluminous, and the author has done a great piece of work in arranging his material so smoothly. Because of its subject matter, if for no other reason, the book is a valuable contribution. Every serologic laboratory worker should have access to this book. The general practitioner would also benefit by reading chapters I, IV, VI, VII, IX, and XVI to XXII, inclusive.



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Vol. LVII, No. 10
New Series

A Discussion of Protamine Insulin*

R. O. Goehl, M.D.
Grand Forks, North Dakota

A NEW ERA in diabetic therapy has begun, which may very well be named the "Hagedorn Era." Since the introduction of insulin 14 years ago, there had been very little modification of this product until Hagedorn¹ and others of Denmark showed that the blood-sugar-lowering action of insulin was prolonged when it was combined with protamine. This product, which was first called protamine insulinate, consists of insulin hydrochloride combined with a protamine prepared from the sperm of a species of trout. The advantage of protamine insulin is its slow blood-sugar-lowering action, which results from its retarded absorption, thus allowing for a more even and prolonged effect upon the blood sugar. Scott and Fisher⁹ working at the University of Toronto, found that the addition of certain metals to protamine insulin further enhanced its absorption, and that zinc seemed most ideal of these metals. This product is the one which is now commercially available under the name "Protamine Zinc Insulin," and is a turbid solution marketed by several companies in the one concentration, U-40.

Since the announcing of protamine insulin, a number of clinicians^{1,2,3,4,5,10,11} have given it careful trial, and almost without exception they have spoken favorably of it and have given suggestions, all of which has led to its present stage of development and usefulness. Joslin⁶, in a recent discussion, suggested that most of the mild and moderately severe cases of diabetes could keep their disease well-controlled by diet and only a single daily dose of this new insulin. If this is true, and

it certainly seems already established, we can readily see the advantage of acquainting ourselves with the use of this new product.

Dosage and Administration

In deciding upon the amount of protamine zinc insulin to be given to a patient, we are able to follow some general rules; but it must be remembered that each case is an individual problem. If the diabetic is already receiving the old type of insulin, then the new product may be started in the dose of two-thirds to the equal of the total amount formerly taken in a 24-hour period. After being on the protamine zinc insulin for a short time, the total amount used becomes less, because the new product is thought to utilize about 20 per cent more dextrose per unit than the regular insulin. A small, supplementary dose of regular insulin may be employed if conditions are such as to make a rapid blood-sugar-lowering effect desirable. Care must be exercised that the peak effect of both insulins does not come at the same time, keeping in mind the facts that regular insulin acts almost immediately and lasts only from three to four hours, while protamine zinc insulin does not begin its effect for from three to four hours and lasts for 12 to 24 hours. In most instances, when both are required, they may be administered at one time, in the morning, but at separate sites, and the regular insulin should be given first if the same syringe is to be used for both. Protamine zinc insulin should be given subcutaneously and not intravenously; and, on account of its slow, prolonged action, it is not recommended for

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the treatment of diabetic coma unless accompanied by the unmodified insulin.

Diet

Protamine zinc insulin has not made any essential change in the dietary regulation of diabetes; and it is just as important now to obtain the intelligent coöperation of the patient in this respect as formerly, when we had only the unmodified insulin. Sometimes, a reapportionment of the carbohydrate given in different meals will assist greatly in maintaining the proper balance. Since protamine zinc insulin exerts its maximum effect later than does unmodified insulin, the carbohydrate of the meal following the injection must in many cases be reduced in order to prevent hyperglycemia, and the amount withheld is then included in the other meals. In this manner, the carbohydrate load may be lessened at one time of the day when it is not utilized well, and transferred to other periods when it is more readily controlled. Each case is an individual problem, and success in many instances will depend more upon the proper apportioning of the diet than upon the alteration of the protamine zinc insulin dosage.

One further thought that seems evident from using the new insulin is the possibility of a more liberal dietary allowance. This is further illustrated by a case mentioned by Sprague, *et al*³, where a severe diabetic was given a large morning dose of protamine zinc insulin and allowed to eat three regular meals per day from the general kitchen, the only restricted foods being candy and raw sugar. On this régime, this patient remained in excellent control. With this suggestion of a more liberal dietary regulation a word of caution is also in line, so that a laxity will not result from the added benefits of this new product.

Reactions

Insulin reactions under protamine insulin have been characterized by their rarity and usually mild symptomatology; but there is a definite tendency for them to be very insidious in their onset. Owing to the slowness with which protamine insulin lowers the blood-sugar level, marked hypoglycemia may result without apparent discomfort to the patient. Such reactions should be avoided, and the occurrence of fatigue, drowsiness, nervousness, headache, nausea, or tingling sensations in the extremities, as well as weakness and sweating, should suggest hypoglycemia, and should be checked up by laboratory tests. If disregarded, these symptoms may be followed by stupor, unconsciousness and perhaps even more serious results. As is the case with any hypoglycemia, these symptoms should be treated by the administration of some form of available carbohydrate. However, a slowly absorbable carbohydrate as well as a rapidly utilizable one should be given. In this way, orange juice or sugar will immediately relieve symptoms, while a glass of milk with crackers will continue a balance of the slowly-acting protamine insulin.

Transfer to Protamine Insulin

For the procedure of changing a diabetic patient who is taking the regular insulin to a schedule of protamine insulin, it was first suggested^{12,13,15} that hospitalization was necessary. Time and experience have changed this feeling, so that now many patients are being transferred without hospitalization; but we should not dispense with close observation when the change is being made. None of the cases that I have observed was in control when I first saw them, yet it was possible to switch them to the new insulin by observing them from the clinic. When protamine insulin is used alone and is given in a single dose before breakfast, the meals usually produce a glycosuria the first few days. However, the blood-sugar level on successive mornings usually decreases progressively, so that there is no glycosuria by the fifth or sixth day. By supplementing the protamine insulin with a small dose of regular insulin, the period of transition can be shortened.

Comment

According to clinical investigation to date^{1,3,11,12}, several methods of using protamine insulin have been suggested which may vary somewhat with the severity of the diabetes. First was the original procedure adopted in Copenhagen, where the insulin protamine compound usually had been given in the evening. Due to the lack of any immediate effect and the prolongation of its action, Wilder¹² was led to give it in the morning with or without a supplementary dose of the old insulin. Campbell and his co-workers¹¹ have suggested that a large dose of protamine insulin before breakfast, and a small dose of the same insulin given at bedtime may be beneficial when a single injection fails to control the glycosuria and hyperglycemia. Still another combination is that of giving old insulin before breakfast and protamine insulin before supper, which carries with it a word of warning¹⁴, since the patient will awaken in the morning with a lower blood sugar than on the old régime, and the action of the old insulin taken before breakfast may be more effective than is expected. Quite recently, Sindoni¹⁵ has suggested that protamine insulin be used only to supplement the usual method of giving ordinary insulin, particularly in the more severe diabetics.

I believe that the procedure of giving a single morning dose of protamine insulin with or without a supplementary dose of old insulin is the most applicable in the great majority of cases. By this method, patients can be watched quite satisfactorily by the use of fasting blood-sugar determinations or simple urinalysis, and definite instructions can be given to patients as to their home care. If glycosuria is present in the late forenoon, then a supplementary dose of old insulin may be necessary before breakfast; but if the urine is sugar-free before breakfast, the old insulin may be omitted or reduced. If sugar shows during the latter part of the day, and particularly on rising, the protamine insulin may need an increase. Protamine insulin should not be altered too frequently, since its prolonged effect makes it necessary to observe its influence for several days at a

time before changing the dosage. Sometimes, sugar will show on retiring because of too great a carbohydrate load; and because of the slow action of the protamine insulin the urine will be sugar-free by morning. Therefore, caution should be used in giving old insulin in the morning; and if used, it should be given just before breakfast, while the protamine insulin may be given as much as one hour before eating. Also, the effect of the slow action of protamine insulin must be considered in the arrangement of the diet. For example, it may be well to give 20 per cent of the carbohydrate allowance at breakfast and 40 per cent at each of the other two meals.

Mention of Cases

In order to emphasize further a few points concerning the value of protamine insulin in diabetes, I wish to cite briefly a few case histories.

The first case is that of a male, age 83, who has had diabetes for several years. Until January, 1937, he had been taking from eight to ten units of regular insulin twice daily (morning and evening), and he would occasionally omit the evening dose because he greatly disliked "fussing with insulin." On this régime, he frequently showed three to four plus glycosuria and at times "did not feel well."

On January 18, 1937, protamine insulin in the dose of 15 units was begun in the morning, as well as a supplementary dose of five units of regular insulin. After the first five days the regular insulin was discontinued, and he has been feeling much better on the new régime with much less frequent glycosuria. Furthermore, he is not as strict with his diet as formerly; yet he seems to get along better. This case is illustrative of a number of diabetics who dislike very much the taking of insulin, and who are lax in adhering to a strict diet. This patient has not only benefited by an increased sense of well-being and the relief of muscular pains since he has been on protamine insulin, but he also can be more liberal with his diet, and gets along on less insulin than would otherwise be necessary. Like many others, he delights in the fact that he can take his insulin in the morning, and then be through with it for the day.

The second case is that of a female, age 46, who was in a serious condition when first seen in February, 1937. She had a severe hyperthyroidism, marked polyuria, polydipsia, and hypertension, and had lost about 40 to 50 pounds in weight. She had never had medical attention, and when first seen, her blood sugar was 425 mgms. She had a moderate acidosis. For the first few days, I attempted to control her diabetes with regular insulin, with some success. However, she was unable to take much nourishment at any one time, and had much difficulty in eating. Because of this situation, I began a morning dose of 30 units of protamine insulin with frequent small feedings during the day and night, and then gave supplementary doses of regular insulin two or three times daily, according to the amount of food she was able to take. On this schedule the patient began

to improve and gain weight so that she could soon take three regular meals daily. This case exemplifies the beneficial effect of the gradual and prolonged action of protamine insulin. As has been shown in recent investigations^{1,2,3}, a more even blood-sugar curve can be sustained by its use. By giving this patient protamine insulin and frequent feedings it was possible more nearly to meet the demands of her hyperthyroidism, namely, a high caloric intake.

The third case is that of a male, age 58, whose diabetes has been present for four or five years. By watching his diet strictly, he had usually been able to get along without insulin until September, 1936, when he began taking ten units of regular insulin before each meal. In February, 1937, he began to have considerable glycosuria. I then transferred him to 30 units of protamine insulin taken each morning. This régime has not only controlled his glycosuria, but has allowed him to be more liberal with his diet. This case, as well as the first one, illustrates how well diabetes may be controlled with less protamine insulin than would be required of the regular insulin; also, that these people are much happier on one instead of three doses of insulin per day, as well as being more liberal with their diet.

In conclusion I wish to quote Joslin in saying that "with protamine insulin, the fundamentals of the treatment of diabetes are not changed; but the ideals of treatment are more nearly achieved. Diabetes today is a disease to be respected, and neglect to do so spells disaster. Diet and exercise are as essential as ever"¹⁴.

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Anesthesia and the Relief of Pain*

By the General Practitioner

John S. Lundy, M.D.†

and

Edward B. Tuohy, M.D., M.S. (anes.)†

Rochester, Minnesota

THIS Fiftieth Anniversary meeting of the North Dakota State Medical Association marks a period of special significance in the field of anesthesia. The developments that are taking place now and those which have taken place during the last twenty-five years, if continued for another twenty-five years, should establish those who are engaged in this type of medical practice as specialists in this relatively new specialty. At one time the anesthetist had no special standing with other specialists, except that he narrowed his practice to the administration of ether by the open drop method. A few enterprising physicians modified the methods, but the progress was slow. Then came the great group of anesthetic agents and methods, most of which are available in some large hospitals and institutions, but in general, many of the most useful ones are still not available in general practice. There are some, however, that seem to serve a useful purpose in selected cases in the hands of a man in general practice, and in general practice there are certain agents and methods that may be used to advantage in certain cases. Some of them will be mentioned briefly.

In addition to anesthetic procedures, the anesthetist of today and tomorrow will be engaged in other related activities, such as the transfusion of blood, resuscitation, and the support of patients through the use of intravenous solutions of dextrose and sodium chloride. We also shall refer to some of these activities.

The local anesthetics, procaine and metycaine⁷, are not used enough in general practice. Most operations, unless major in character, have been done and could be done under infiltration anesthesia. For example, the injection of 10 to 20 cc. of a 2 per cent solution of procaine or metycaine into the hematoma of a recent fracture provides an almost ideal anesthetic for the reduction of a fracture. The resulting anesthesia will last sometimes as long as an hour so that a cast may be applied after the reduction has been accomplished.

For abdominal operations it is advantageous to inject a 0.5 per cent solution of procaine or metycaine with epinephrine into the line of incision in the abdominal wall. Six minims (0.37 cc.) of epinephrine in 1:1000 concentration is added to each 200 cc. of a 0.5 per cent solution of the anesthetic agent. This tends to make the incision dry and reduces the amount of general anesthetic that would otherwise be necessary.

Certain methods of block anesthesia also are of value. If the physician would make the effort to use caudal

anesthesia occasionally, he would find many cases in which it could be used to advantage. It produces a "saddle type" of anesthesia so that any operation on the rectum, vagina, perineum, or urethra may be carried out. It may be used in operative obstetrics, although a simpler injection will usually suffice. When the patient is in the lithotomy position, the injection of 10 to 15 cc. of a 1 per cent solution of procaine or metycaine just mesial to the tuberosities of the ischii will produce anesthesia of the anterior half of the perineum that will last for more than half an hour. This injection may be repeated from time to time if necessary. This produces anesthesia of the labia and urethra but not of the anus. However, this block may be supplemented by the injection of very small amounts of a 0.5 per cent solution of procaine or metycaine at the points at which tenderness occurs, if necessary.

Other blocks that are easily done are block of the ulnar nerve at the elbow, or the hand or foot may be anesthetized by intradermal or subcutaneous injection and injection through the balance of the tissue to the bone. This bracelet can be accomplished easily, and it is usually done with a 0.5 per cent solution. If the needle actually touches a nerve trunk, it should be immobilized there and 5 or 10 cc. of a 1 per cent solution should be injected.

For operations on the neck, one may use deep and superficial cervical block or just a superficial block plus infiltration. These serve admirably in most cases, provided that with this block, or with any other form of local anesthesia, the patients, especially nervous ones, are given preliminary medication the night before and the morning of operation. Pentobarbital sodium (nembutal) is given in a dose of 1½ grain (0.097 gm.) by mouth the night before; this dose is repeated the next morning when the patient awakes. For adults, 1/6 grain (0.01 gm.) of morphine sulphate and 1/150 grain (0.0004 gm.) of atropine sulphate should be administered by hypodermic injection at least thirty or forty minutes before anesthesia is to be induced. In some cases an additional 1½ grain (0.097 gm.), or even 3 grains (0.2 gm.), of pentobarbital sodium (nembutal) may be necessary, especially if the patients are suffering from pain; if the pain is intense, more than 1/6 grain (0.01 gm.) of morphine will be required to bring the patient to a condition in which he will cooperate and permit the use of a local anesthetic. For children about ten years of age or less, the use of pentobarbital sodium (nembutal) is a very worthwhile measure, and the amount necessary to eliminate apprehension on the part of a child may be

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† Section on Anesthesia, the Mayo Clinic, Rochester, Minnesota.

a dose which will also put him in a condition called basal narcosis, from which one can barely arouse him. When he is in this condition, one may proceed with the administration of the local anesthetic and do most operations that might be carried out on adults under local anesthesia. Such medication is also of value in bringing children to a condition in which blood transfusion may easily be carried out. They do not struggle and pull away when one is attempting to carry out venipuncture, and they will lie quietly during the administration of blood or other intravenous solutions that may be necessary. The venipuncture is also facilitated by the fact that barbiturates tend to increase the circulation of blood in the extremities and definitely increase the temperature of the extremities; the veins will be better filled with blood and for that reason will more easily be entered with the needle.

While preliminary medication in doses sufficient to produce marked effect is important in connection with local anesthesia, it is not, as a rule, a good measure in connection with inhalation anesthesia, for in most instances it is better to employ only moderate doses of preliminary medication. It is better not to give a hypodermic injection of morphine when ether is to be used by the open drop method, for the reason that ether and morphine each depress respiration and the two together often depress respiration before the patient receives enough ether to produce relaxation. A situation may be brought about in which operation cannot proceed without relaxation and when one is without sufficient assistance nothing further can be done, except to infiltrate the abdominal wall and attempt to proceed by using a form of balanced anesthesia in which the preliminary medication, local anesthesia, and light ether anesthesia may suffice.

If one wishes to use nitrous oxide in the home, it will be necessary to obtain a gas machine of the portable type and have someone to operate it. The same is true of ethylene and cyclopropane but additional precautions are necessary with the latter agents because of their inflammable and explosive qualities. If a case calls for this type of anesthesia and it can be provided, one should obtain a canister of soda lime and use it so that the expense of the gas is reduced to a point which is not prohibitive, even in the charity case.

Cyclopropane has been a recent development and is of value when a general inhalation anesthetic is to be used, when ether must be avoided, and when fireproof conditions are not necessary. Most people tolerate cyclopropane very well, but a few do not tolerate it in doses sufficient to produce deep surgical anesthesia. It is advisable, therefore, to palpate the pulse throughout the period of induction, and if it becomes markedly altered in character and volume, the patient may be considered unsuitable for deep anesthesia with this gas, and ether will have to be added rather than more cyclopropane. In obstetric cases it is being employed by several men^{1,3} with satisfaction. This might be expected from the fact that anesthesia is induced more quickly with it than with the other gases or ether, and a high percentage of

oxygen may be administered with cyclopropane without reducing its efficiency as an anesthetic.

In the use of inhalation anesthetic agents, there is one aid which should be generally used and that is the Magill large-bore, soft-rubber intratracheal tube, which, when greased, may be passed through the nose and into the throat and, in more than half the cases, will find its way into the larynx and then into the trachea. With this tube acting as an airway, the administration of a general anesthetic is made easy. Respirations are quiet and effortless and ventilation is adequate. It is important that the use of this method be mastered by those who are either to administer the anesthetic or are to be responsible for its administration. When the tube will not enter the larynx easily after being introduced through the nose, it may be necessary to use a tongue depressor and raise the tongue and epiglottis and introduce the tube under direct vision, either through the nose or through the mouth. A lighted instrument such as a laryngoscope greatly facilitates such a maneuver, but if an assistant is at hand, another light may be used to illuminate the throat. This method is one that will become widely used, and I wish to call your attention to the advisability of acquainting yourselves with it, for not only is it of great value in the administration of an inhalation anesthetic, but it also may be used for the resuscitation of individuals who have for any reason become asphyxiated. The great ease with which artificial respiration can be carried out either manually or mechanically needs to be sufficiently emphasized so that the Magill tube will shortly be available whenever a physician is available.

A modification of this technic is carried out to advantage in the resuscitation of the newborn, when a catheter and glass tip may be used to aspirate mucus from the baby's throat and trachea. The tube may be also slipped into the larynx and artificial respiration may be carried on by direct inflation by blowing through the tube.

Rectal anesthesia with oil in ether is often used to advantage in obstetric cases, but it is seldom used in other cases; however, there are times when it might well be used provided the dose is that which is only sufficient to bring about basal analgesia. One of the disadvantages is, of course, that patients exhale the ether very shortly after they begin to absorb it into their blood stream from the rectum, and so morphine is necessary, especially in adults, in order to depress respiration a little and thus minimize the rate of escape of the ether in surgical cases. In obstetric cases one must be guided by the conditions as they present themselves and be governed accordingly in the use of this method.

For surgical operations the drug tribrom-ethanol (avertin), when given in a dose small enough to produce basal analgesia, is useful as it breaks down in the body and is not exhaled. Its effect is more certain than oil and ether by rectum, it lasts longer, and, for children who safely tolerate this agent in larger doses than do adults, this drug brings a patient to a condition in which many procedures may be carried out by merely supple-

menting this form of anesthesia with local anesthesia or a very light ether anesthesia by the open drop method.

Barbiturates may be administered by rectum to bring about a somewhat similar effect, and from a standpoint of convenience, this may be more useful in general practice than ether in olive oil, or avertin. This is especially true when one is faced with the problem of transporting a patient who has been severely wounded or burned, or who has convulsions or a psychosis. The safest way to use such barbiturates is to introduce a capsule of the barbiturate into the rectum just as one would administer a suppository. The original dose should be administered and followed at intervals of twenty to thirty minutes with smaller amounts until the patient is brought under control. One of us (Lundy) used this scheme on an insane adult until he was thoroughly quieted. The patient then was placed on his side in the back seat of an automobile and transported as far as 100 miles without untoward result.

The intravenous anesthetics⁵, evipal soluble and pentothal sodium, are helpful if one is cautious in their use. They should not be administered to individuals who have symptoms of dyspnea, whether because of pulmonary or cardiac disease, nor to a patient who has any degree of respiratory obstruction or is likely to have respiratory obstruction during or after anesthesia. They should not be administered to children who are ten years of age or less, because respiratory depression is associated with the surgical stage of anesthesia, and in children who have small respiratory passages this tends to cause an unsafe degree of pulmonary hypoventilation. These agents are not especially potent anesthetics and are very useful for short procedures, which last five or ten minutes, such as the extraction of a large splinter or removal of painful packs, and for many short minor operations in which the patient's jaw can be well sustained by some individual. A cotton or paper "butterfly"⁴ should be used to indicate that the respiratory passages are patent and being used. Anesthesia is quickly induced and can be maintained by keeping the needle in the vein and administering small quantities of the drug in a 5 per cent solution from time to time, much as one would administer ether intermittently by the open drop method. In general practice, the use of these drugs for procedures which last longer than five or ten minutes requires an additional person to administer the anesthetic. For short operations, it is possible to induce anesthesia and withdraw the needle and then carry out the contemplated procedure. If this is to be done, anesthesia should be slowly induced, as the patient counts, so that the voice may be audible, or the patient may raise the other arm and the anesthetic may be injected until the arm falls. Then, after a minute has elapsed, 1 or 2 cc. more of the solution may be injected slowly by using the character of the respiration as a guide. Respiration should not stop entirely at any time. It is the administration of the drug in divided doses that permits the induction of anesthesia slowly and with relative safety. When one is without an assistant, one may have to resort to the less desirable method of

administration, which is not as safe as the intermittent method. The concentration of the drug in the solution should not be more than 5 per cent, and if the patient stops breathing and shows signs of asphyxia, a clear airway should be maintained by sustaining the jaw, and manual artificial respiration should be carried out, or oxygen and carbon dioxide should be administered if they are available. The patient should survive if the period of asphyxia has not been too long and if he is ventilated by artificial respiration until automatic breathing returns. Delay in maintaining a clear airway by sustaining the jaw might be fatal.

Since these drugs are barbiturates and in general are anti-spasmodics, they may be used in the control of convulsions, but because of their transient effect they may not be as satisfactory as is sodium amytal or pentobarbital sodium (nembutal), which are used in conditions associated with eclampsia, tetanus, and poisoning by convulsants such as strychnine, or in those rare cases in which convulsions are associated with general anesthesia. In the latter cases the patients are often children who have an acute infection, such as acute appendicitis, and on being anesthetized with an inhalation anesthetic begin to twitch and convulse and may die unless the convulsions can be controlled until the anesthetic has been entirely eliminated and until the toxemia of the infection subsides. Avertin may be used instead of the barbiturates in many cases; it is especially useful in tetanus, where it may be alternated with the barbiturates with the hope that less pulmonary edema will take place if the patient is not given huge doses of the same drug one or more times daily.

The use of intravenous therapy is really about as valuable in general practice and in the home as it is in institutions. By the use of a little foresight, a physician in a community can readily² group the blood of a few persons, and if one needs blood for a transfusion, the physician may send for an individual to come to the place where he is needed, or the donor may come to the office where the physician may draw the blood, add a citrate, put it in a sterile bottle, and carry it to the place at which it is to be used. If it is not all needed, the remainder can be put in a refrigerator at 40° F. and can be kept for a week or ten days and still be used. We do not like to use blood after it has been kept in a refrigerator for longer than twelve days. At the present time we know of no reason why citrated blood is not as beneficial as unmodified blood, and we believe the method of indirect transfusion is much simpler for the general practitioner, as well as for use in the hospital.

Our custom is to add 18 grains (1.16 gm.) of sodium citrate and 50 cc. of physiologic saline solution or sterile distilled water to 500 cc. of blood. The blood is collected in this solution which is stirred all the while so that the blood will become citrated immediately and as fast as it is drawn.

The administration of blood should be not faster than 15 cc. a minute, and many physicians prefer to use a Murphy drip arrangement in the tubing between the bottle and the needle. In most instances an 18-gauge

needle is the best size for the administration of blood and intravenous solutions. A 19-gauge or 20-gauge needle may, however, be used.

When blood is not available, a 6 per cent solution of acacia in physiologic saline solution is a temporary substitute, and in some cases this will support the patient sufficiently; therefore, many physicians consider it a good substitute for blood. Sometimes it may be given before or after some blood has been given; it also may be used when blood is needed in a large quantity but not much of it is available. One should, however, guard against mixing the solution of acacia and the blood in the buret, tube, or needle, for the acacia changes the sodium citrated and allows the blood to coagulate. This does not occur in the vein, as the solution of acacia is very quickly and markedly diluted.

A 5 to 10 per cent solution of dextrose is very useful for many purposes when patients need fluid or food and cannot take them by mouth. Physiologic saline solution is of marked usefulness in many conditions of dehydration, such as starvation or excessive or prolonged vomiting. It is, of course, of great value in replacing the

large amount of salt lost in the exudate in cases in which patients have been severely burned.

Venipuncture may be accomplished readily if heat has been applied to the whole of the extremity for twenty to thirty minutes, as has been described elsewhere⁶.

The rate of intravenous injection of solutions should be about the same as that recommended for the administration of blood.

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The General Symptomatology* Of Common Rectal and Anal Diseases

James Kerr Anderson, M.D., F.A.C.S.†

Minneapolis, Minnesota

PATHOLOGICAL changes are present in and about the anus and lower end of the rectum in approximately 15 per cent of people. The relief of these difficulties will be accomplished by treatment of the findings discovered by examination of the rectum and anal canal. This examination should consist of inspection, palpation, and vision through an anoscope and proctoscope. Most of these patients present symptoms referable only to the area in question; but a few complaints are more general in nature, which, when investigated, are found to be due to rectal or anal pathology. Correct diagnosis, of course, is necessary for successful treatment, and while subjective symptoms are important, they are not to be relied upon to establish the diagnosis, and should always be supplemented by a careful local examination. To the laity, and unfortunately, many physicians, "rectal trouble" means "piles," and too often a suppository or ointment is prescribed without examination, or used upon the advice of a friend.

We cannot control a patient or his friends, but no physician should prescribe treatment without a definite evaluation of symptoms, adequate examination, and reasonable assurance of the pathology actually present. Failure to diagnose correctly may be excused, but NOT failure to examine adequately. There is nothing particularly difficult or obscure about the diagnosis of the ma-

jority of rectal and anal diseases, yet I am sure that rectal examination is the most commonly neglected procedure in medical practice, even when the patient's complaints are suggestive. It is common observation that an appreciable percentage of patients suffering from rectal malignancies have had a hemorrhoidectomy, or some anal treatment, shortly before the discovery of the more serious lesion. Most of these omissions in diagnosis could have been avoided had an adequate examination been carried out when the patient first presented himself. The eventual discovery of the existing malignancy occurs only because the patient's symptoms continued to increase in severity, rather than diminish, following the operation.

Before taking up various local symptoms and the attendant pathology, a brief discussion of the anatomy of the region is essential.

The rectum is derived from the posterior division of the hind-gut and the anal canal from the proctodeum; different germ layers. Where these tubes or blind pouches approximate in intrauterine life is evidenced throughout life by a line or ridge, seen encircling the bowel. Usually this line or ridge, called the anorectal line or junction, the pectinate or dentate line, and by some, the white line of Hilton, is well within the anal opening ($\frac{1}{2}$ to $\frac{3}{4}$ of an inch), but occasionally is seen upon spreading the nates and anus. The length of the

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† Instructor in Surgery, University of Minnesota.

anal canal is subject to some variation. This anorectal line or junction serves as a means of classifying lesions—those distal being anal, and those proximal, rectal. It also indicates the change in blood supply and drainage, the lymphatic drainage and the nerve supply. This anatomical landmark should always be identified in the anoscopic examination, particularly if any injection treatment is anticipated.

The lymphatic drainage is particularly important in reference to lymphopathiavenerum (lymphogranuloma inguinale), distal to the anorectal line to the inguinal glands, and proximal to the glands about the rectum. There are also distinct differences in the male and female, accounting for the preponderance of strictures seen in women. The difference in the nerve supply above and below this anorectal junction is most important. Above the line, that is, in the rectum, the nerve supply is primarily from the sympathetic nerves, thus here a poorly-developed pain sense. Below the line in the anal canal, the nerve supply is from the spinal nerves, which renders this area most sensitive. Non-surgical or injection methods may be used above the line, but never below, for this reason alone.

Pain is the most frequent symptom which brings the patient to the physician. It very often indicates an inflammatory lesion, or the result of a vascular accident in the anal canal distal to the anorectal line, although inflammatory lesions in the rectum causing much distension also produce acute pain. The location of the pain is important and helpful; it may be low and close about the anus, in the anal canal, rectum, or buttocks. It may be generalized about the anus, or definitely localized in a small spot or area. The character may be dull, sharp, sudden, spasmodic, constant, throbbing, or limited to a mild tenderness. The time of the pain relative to the bowel movements is very helpful. Sharp pain coming on during or immediately after the movement is usually diagnostic of a lesion in the anal canal, such as an ulcer, fissure, or thrombosis. A throbbing, constant pain, usually means an acute inflammatory process which may be under the peri-anal skin, about the canal, or in the rectum. Early in its development, this may be only tenderness, but as pus accumulates and the tension is increased, acute pain develops. Lesions in the rectum, inflammatory or neoplastic, may progress to a marked degree without causing pronounced symptoms, this again being due to the lack of sensory nerve supply. This is in marked contradistinction to the same type of lesions in the anal canal, where the sensory nerve supply is profuse and pain is acute. Pain may be referred to other structures, as the bladder, coccyx, uterus, prostate, etc. It is very common for pain to be referred in rectal lesions, and backache, sciatica and dysuria often disappear following the treatment or removal of hemorrhoids, or other anal pathology. The question of referred pain is complicated, and many times difficult to explain. Spasmodic pain is commonly seen in ulcerative lesions in the anal canal—fissure and ulcer being the most common. Anything causing an irritation of the sphincter muscle causes pain, such as an anal thrombosis, foreign

body, prolapsed papilla, or internal hemorrhoid. Types of pain with non-thrombosed hemorrhoids are dull, bearing-down, and spasmodic when protruded. If prolapsed and strangulated, a throbbing constant pain is present. If thrombosed, a constant burning, distension type is present, which is aggravated by movements. With a fissure or ulcer, the spasmodic pain is definitely aggravated by the movement and may last several hours. With abscess, the pain is constant and gradually increasing—the amount depending upon its location and extent.

Bleeding is one of the most common and important symptoms presented, and should always demand a comprehensive anal, rectal, and sigmoidoscopic examination. Bleeding is more common in adults; but is seen fairly frequently in children, and with them, it is usually due to polypi, prolapse, adenoma, diverticula, intussusception, or trauma from a constipated stool. The origin of the blood in adults may be any of the following: hemorrhoids, prolapse, fissure, ulcer, stricture with ulceration, malignancy, proctitis, colitis, polypi, adenoma, diverticula and intussusception. While the type of blood, its amount and time of passage are important and suggestive, they give no definite indication as to the type or location of the lesion. Bleeding in rectal disease may be profuse or scanty, bright red or dark and clotted, accompanied or not by pain. These symptoms can be brought out easily in the history. Profuse bright red blood following the stool and without pain, usually indicates internal hemorrhoids or a sloughing area from a previous injection treatment. A small amount, or streaks on the toilet paper, accompanied by some pain or discomfort, suggests a fissure, ulcer, or tear in the anal canal. Fresh bright red blood, of course, suggests a lesion low in the rectum or anal canal, while dark or clotted blood indicates a higher origin. It must be remembered, however, that blood from internal hemorrhoids may not be expelled immediately, and hence becomes dark and clotted and may thus be quite misleading. On the other hand, a malignant ulcerative neoplasm may bleed profusely and the blood may be expelled before becoming clotted and dark. A search for the bleeding-point should, of course, be made, first using an anoscope and if not found, a proctoscope. It is very difficult at times to locate the bleeding point, even though the bleeding has been recent, and there is even fresh blood in the rectum. If a bleeding-point is discovered, a suture or touching with the actual cautery may be necessary. Bleeding usually frightens the patient, and brings him to the physician. If all cases presenting this symptom would present themselves, I am sure many malignancies would be discovered earlier, and in a more favorable stage to operate.

Protrusion about the anus or from the anus is quite common. Whether the protrusion is present at all times, or only following the movements, should be elicited. The relation of the protrusion to the passage of the stool gives some index as to the extent of the pathology, as well as to the type. The common types of protrusion following the passage of stool, gas, straining, or excessive exertion, are hemorrhoids, hyper-

trophied papillae, prolapse, or pedunculated polypi. The common, constantly present protrusions are skin tags, external thromboses, old atrophied external hemorrhoids, and condyloma accuminata. Internal hemorrhoids are arbitrarily classified as to their replaceability into four degrees. Those of the first degree do not prolapse at any time; those of second degree prolapse with straining, but replace themselves on cessation of straining or upon lying down; those of the third degree prolapse and have to be replaced, usually following each movement; those of the fourth degree are constantly prolapsed. Bleeding at the time of protrusion is common, and assists in the diagnosis. The same may be said of pain with protrusion, which is relieved after the protrusion is replaced. It is commonly observed that patients will complain of a protrusion when they are referring to a protrusion which is always present and cannot be replaced; or to a bulging, which occurs on straining. These, of course, are not protrusions in the sense that they descend through the anal canal.

Itching is a very frequent and troublesome complaint, and is often due to lesions or pathology in the anal canal or lower rectum. Hemorrhoids, cryptitis, papillitis, parasites, prolapse, fissure, and fistula are the notable contributors. In those cases in which there are these contributing factors, other symptoms are usually present. Local itching usually has its origin locally, except in those persons with certain constitutional diseases, and with these, other areas are pruritic. Fortunate is the patient with pruritus who has local pathology about the anus, because it is these cases which can be aided most. Pruritus ani without any local pathology or any detectable contributing factors is one of the most discouraging ailments encountered, for both the physician and the patient. It is the consideration of the treatment and etiology of pruritus ani which offers such controversy, because the symptoms are well-defined.

Discharges other than blood—Excess of mucus usually means an acute or chronic inflammatory, or neoplastic, process in the rectum. The exception to this is mucous colitis, where large quantities of mucus are expelled, and yet the bowel mucosa appears quite normal. Pus, in any amount, indicates an internal fistula, sinus, or ulcerated mucosa. Smaller amounts may come from smaller sinuses, single ulcers, or chronic colitis. With malignant lesions, the mucus is usually mixed with the blood, and there is a characteristic musty odor present. Moisture about the anus means some low pathology in the anal or local skin from which serum escapes, the patient often considering this as a rectal discharge.

Constipation—The usual type seen is of the habit variety but examination should be carried out to eliminate stricture or some mechanical narrowing within the

length of the proctoscope. If this is negative, an X-ray study with a barium enema is indicated.

Diarrhea—Proctoscopic examination will many times reveal the underlying pathology, as in different types of colitis and malignant disease. Diarrhea, to a patient, may mean the passage of any liquid; mucus, pus, blood or liquid stool. Internal rectal abscesses which rupture into the bowel may simulate diarrhea. A heavy feeling in the rectum should always be investigated, as many times malignancy may be the cause. Fecal impaction also gives this symptom, but this seldom occurs in an ambulant patient. Tenesmus suggests irritation or inflammation of the rectal mucosa, and is caused by various lesions, such as colitis, malignancy, impaction, or pressure from extra rectal tumors.

Referred symptoms are often caused by rectal and anal lesions. Back-aches are a common accompaniment of hemorrhoids, fissure, malignancy, prolapse, and impaction. Pains down the legs or sciatica-like pains are often seen with fissures, hemorrhoids, abscess and cryptitis. Local symptoms, however, are usually present. Scanty or absent menses are often seen with fissure and hemorrhoids. Urinary difficulties are possibly most frequently observed in anal fissure. Slowly protracted, hemorrhoidal bleeding is often overlooked as a cause for an unexplained secondary anemia (the pale appearance of the bowel noted on anoscopic and proctoscopic examination may give the first clue). We have seen cases in which the hemoglobin fell to 18 per cent from bleeding hemorrhoids. Rectal symptoms with emaciation is always an index of gravity, and should demand proctoscopic examination as well as a barium ray. Nervousness and irritability are many times due to anal and rectal lesions, particularly hemorrhoids, fissure, ulcer and cryptitis. The effect of these lesions is many times not recognized until the pathology has been removed.

Conclusions

Non-malignant, rectal, and anal diseases are quite common, and malignant ones, too common.

The diagnosis of these diseases is not particularly difficult when a careful history is taken, proper evaluation made of the symptoms presented, followed by a careful painstaking digital, and an anoscopic and proctoscopic examination.

Cases presenting rectal or anal symptoms are entitled to a digital and visual examination of the anus and rectum, at least to eliminate the possibility of a malignant lesion.

Early and operable malignancies are most often first seen by those doing general medicine, and in order to increase the percentage of early diagnosis, it behooves us all to be on the alert.



Feeding Problems in Infancy*

George E. Robertson, B.Sc., M.D. †

Omaha, Nebraska

ONE OF THE advantages of breast feeding over artificial feeding lies in the fact that feeding disturbances are met with much less frequently in the breast-fed child than in the artificially-fed one. This applies to all the ordinary symptoms interpreted as feeding disturbances, except those due to organic disease in the infant. For this reason, this discussion will deal largely with feeding problems as they occur in the artificially-fed infant, with occasional reference to situations that arise in the breast-fed infant.

Feeding difficulties met with by the pediatrician may be classified according to their causes in the following ways:

Causes of Feeding Difficulties

1. Errors in formula prescription.
2. Errors in formula preparation.
Milk and top cream not mixed, spoiled milk, faulty refrigeration, milk not boiled, incorrect measuring.
3. Errors in feeding technic.
Poor schedule, improper or plugged nipples, air-swallowing, milk not at proper temperature, over-handling and over-stimulation.
4. Organic disease in the infant.
5. Low tolerance for carbohydrate.
6. Low tolerance for cows' milk.
Allergy.
7. Intolerance for cod liver oil or orange juice.

Errors in formula prescription usually result from the physician's failure to observe the familiar rules covering the infant's feeding requirements, or his neglect to apply the familiar devices used to individualize a formula to a particular infant's symptomatic response.

Errors in formula preparation usually result from lack of detail in the explanation made to the mother in connection with the formula prescription. They can usually be avoided if a demonstration of formula preparation technic is provided for each mother. Familiar errors in formula preparation are: the failure thoroughly to mix the cream with the milk before the milk is measured; use of milk which is slightly spoiled; faulty refrigeration of the formula; failure to boil the milk, or failure to remove the thin film, which forms during the boiling process; the use of incorrect measures, or carelessness in measuring out the quantities prescribed.

Errors in the feeding technic are usually the result of oversight on the part of the mother. They include carelessness in following the schedule specified by either feeding irregularly, too frequently or at intervals which are too long; the use of improper nipples, with holes either too large or too small, or the use of nipples which

have become plugged by a precipitated milk; failure to remove the air from the stomach, after the nursing; and the very common error of over-handling and over-stimulation of the child by active play near the feeding time.

The rôle of organic disease in producing symptoms in infants must always be borne in mind. Any disease affecting the child, or any one of the child's systems, may produce gastro-intestinal symptoms.

The three last causes are those in which the baby's formula actually does not agree with the child, due to conditions inherent in the child, which bring about a decreased tolerance for one or more of the elements of the formula.

This group, alone, represents what might be termed true feeding problems, *i. e.*, the disturbances due primarily to the elements of the feeding. It is in the management of the infants falling into this group that the ordinary rules for infant feeding fail. In this group are included those cases, which incidentally are rare, in which allergy is the underlying cause of the disturbance.

Requirements for Adequate Diet

1. Sufficient protein, carbohydrate, fat, water, mineral salt, vitamins A, B, C, and D.
2. Sufficient calories.
3. Food must be clean and digestible.

Formula must supply:

Protein— $1\frac{1}{2}$ to 2 oz. cows' milk per pound in 24 hrs. (Limit—32 oz.)

Fat—Supplied by above milk.

Carbohydrate—1 oz. added for each 10 to 20 oz. of cows' milk (5–10%).

Calories—50 per pound in 24 hrs.

Water— $2\frac{1}{2}$ oz. per pound in 24 hrs.

The requirements for an adequate diet for a child are familiar. There are certain reciprocal relationships which exist in these requirements. The first is the relationship between the caloric value per ounce, and the fluid requirements of the child. A formula providing 20 calories per ounce, a value equal to that of breast milk, exactly satisfies the fluid requirements of the child. A formula low in protein must necessarily be high in carbohydrates, and *vice versa*, a formula high in protein must necessarily be low in carbohydrates. Consideration of these factors is of importance in altering the formula to suit the symptomatic response of the individual infant.

Familiar Devices in Infant Feeding

For Vomiting—

Diminish quantity of food.

Lengthen feeding interval.

Reduce fat content.

For Diarrhea—

Reduce carbohydrates.

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† Instructor in pediatrics, University of Nebraska College of Medicine, Omaha.

- Reduce fat.
- For Constipation—
 - Increase carbohydrates.
 - Decrease fats.
- For Anorexia—
 - Lengthen feeding interval.
 - Decrease concentration.
- For Failure to Gain—
 - Strengthen formula.

The devices employed in altering the formula to meet the symptomatic response of the infant recognize the necessity for considering the infant's stomach capacity, its emptying time, his reaction to cows' milk, his response to cows' milk fat, and his ability to handle various types of sugar. The size of the individual feedings must be determined by the infant's stomach capacity. The length of the interval between feedings must depend upon how rapidly the stomach empties. The fat content of the formula may delay the emptying time. Formulas high in carbohydrates tend to produce loose stools. Those low in carbohydrates tend to produce constipation. A high fat content in the formula may produce either diarrhea or constipation. The application of these few facts makes possible successful feeding of the larger majority of all normal infants on simple milk dilutions with varying percentages of carbohydrate added, and the solving of many of the minor digestive disturbances that arise.

In the cases that show persistent symptoms in spite of management of this type it is necessary to go into rather complete detail in the study of the individual case.

Management of Feeding Problems

1. Rule out all other factors before attributing symptoms to formula.
 - A. Pre-natal and birth history.
 - B. Detailed feeding history.
 - C. Complete physical examination.
 - D. Laboratory work as indicated.
 - a. Stool examinations.
 - b. Gastric lavage to determine emptying time.
 - c. Blood count—hemoglobin.
 - d. Urinalysis.
 - e. Roentgenologic examination.
 - f. Blood pressure.
 - g. Tuberculin test.
 - h. Blood Wassermann.
2. Change formula only when indications are clear-cut.
 - A. Frequent changes of formula are not desirable.
 - B. Infant requires 3 or 4 days to adjust to change in formula.
3. Temporary underfeeding may be necessary in some cases.
 - A. Fluid intake must be maintained.
 - B. Return to full diet must be gradual.

4. Dangers in rapid weight gain are slight if due attention is paid to vitamins and minerals.

In the management of feeding problems of this type it must be the first principle in the investigation of each case to rule out all other factors before attributing the symptoms exhibited to the formula alone. A careful and complete history must be taken of the child, including pre-natal factors, such as maternal health and diet, and length of term, birth history, with particular reference to injury, and all the minute details relating to feeding. A careful physical examination should be done, supplemented by such laboratory work as may be indicated. Stool examinations are not done as frequently as they were at one time, or as frequently as they should be done. Considerable information can be obtained from an examination of the stools as to the digestive efficiency of the child's gastro-intestinal tract. Gastric lavage is of value in cases of vomiting in determining the emptying time of the stomach. It may also serve to reveal the presence of undue amounts of mucus in the stomach, which may be concerned in the production of the symptom, vomiting. In connection, especially, with those infants who show nutritional failure, examination of the blood may be of great value. The presence of iron deficiency anemia, or the presence of some other type of anemia often explains certain cases of failure to gain. A urinalysis may likewise explain some of these cases. X-ray examination should be done in every case of persistent vomiting, in order to rule out the possibility of organic obstruction. Among the laboratory procedures, almost universally overlooked in the care of the infant, is the determination of the blood pressure. This may be of value in the recognition of early cases of acrodynia. In all cases showing nutritional failure, the tuberculin test and blood Wassermann should not be overlooked.

The principles underlying the management of the feeding problems are as follows:

It is not necessary to change an adequate formula unless clear-cut indications for such change can be made out. Frequent changes in the formula are not only not desirable, but may be actually harmful to the child. The average infant requires three or four days to adjust to a change in his formula, and it is impossible to evaluate the results of the change in a period less than this. In cases of vomiting, diarrhea, anorexia, and failure to gain, temporary underfeeding may be necessary. While this is being carried out, it is necessary to watch very carefully the fluid intake of the child. When symptomatic relief is apparent, the return to full diet must be accomplished in a gradual manner. After symptomatic relief, weight-gain is often very rapid. The danger in rapid weight-gain is very slight, if due attention is paid to vitamin and mineral content of the diet. This is mentioned in order to call attention to the inadvisability of restricting too greatly, the diet of the child who is showing a rapid weight-gain. It is much wiser to increase the vitamin and mineral content of the child's diet, and continue to provide sufficient food for his requirements.

The older articles on feeding problems are difficult to interpret because of the use of classifications employing such terms as dyspepsia, milk injury, dystrophy, atrophy, weight disturbance, decomposition, *etc.* A clearer and more workable classification of the common feeding problems is reached by considering them according to the symptoms presented. This method of classification is used without any disparagement of the older classifications or the theories on which they are based.

Possible Causes of Colic

1. Hunger?
2. Overfeeding?
3. Gastro-enterospasm?
4. Carbohydrate fermentation?
5. Protein indigestion?
6. Tough curd formation?
7. Fat intolerance?
8. Air-swallowing?
9. Immaturity of gastro-intestinal tract?
10. Calcium deficiency?
11. Fatigue toxin?
12. Allergy?
13. Abuse of laxatives, enemas and suppositories?

Consider first, the familiar symptom, colic. It is well to call attention to the fact that some observers consider colic to be such a common occurrence that they would rather interpret it as a characteristic of the infant, rather than as an abnormal symptom. These observers call attention to the fact that all infants are more or less colicky. No one can deny that the more colicky infant is often a very troublesome problem. In the literature on infant feeding there have been a vast number of causes for colic advanced by different authors. Marriott has said that colic is hunger, nothing more. Other observers say that all colic is due to overfeeding. In the same way, the rest of the causes stipulated have been indicted by different authors in papers dealing with the subject of colic. It is often very difficult to determine just what factors may be active in a particular situation.

Management of Colic

During attack—hot water bottle to abdomen, carminative, enema.

Prophylactic:

1. Check formula—actual amounts taken against requirements.
2. Check feeding schedule—too frequent feedings common—4-hour schedule is desirable.
3. Check associated symptoms—may suggest desirable changes in formula or management.
4. Restrict enemas or suppositories to once daily.
5. Discontinue laxatives.
6. Sedative—elixir phenobarbital gtt. X to XXV before feeding.

In the management of colic, there are two phases of the situation to be considered: First is the management during the attack, when the infant is screaming with pain, drawing his legs upon his abdomen, and in very evident distress. The attack can generally be relieved by applying a hot water bottle to the abdomen,

the use of a carminative, such as elixir catnip, and fennel; or a small portion of a soda mint tablet in water, and the use of an enema to empty the bowel of gas.

Second, the prophylactic management is of much more importance. The details of this are enumerated above. In a check of the formula it is not only necessary to determine whether the total formula is adequate, but also to determine whether the amounts taken are sufficient. On dilute formulas, the amount taken may often be too little to provide an adequate food intake. The feeding schedule usually reveals that the infant is being fed much more often than the formula prescription specifies. A four hour schedule is usually advisable in these cases. It can be instituted most readily when sedatives are employed. Associated symptoms, intelligently interpreted, furnish valuable indications in management. The presence of vomiting and regurgitation suggests too frequent feedings which never permit the stomach to be emptied. The loose, acid and frothy stools of carbohydrate fermentation suggest the use of too high sugar content. Constipation suggests too high fat content in the formula or underfeeding. If the formula is found to be satisfactory and does not contain more than approximately seven per cent added carbohydrate, and if the feeding schedule is being followed conscientiously, the probability is that either the use of too much rectal stimulation, by enemas or suppositories, or the abuse of laxatives, plays a part in the production of the symptom. The use of an evaporated milk formula containing about seven per cent added carbohydrate, such as dextri-maltose, diluted to provide 20 calories per ounce, plus the administration of elixir phenobarbital, in doses from 10 to 25 drops, before each feeding, is generally found to be helpful in these cases. The use of cereal waters as the diluent in the formula may be necessary in certain instances.

Vomiting

Carefully exclude all other factors before attributing vomiting to the milk formula alone.

Air swallowing.

Excitement—too much handling.

Infection—chiefly parenteral.

Mechanical obstruction.

Seldom due to intracranial pressure alone.

May rarely be a constitutional characteristic.

Normal weight gain in face of persistent vomiting.

The symptom, vomiting, is one of the most frequent of the digestive complaints exhibited by both breast-fed and artificially-fed infants. It is necessary carefully to exclude all other possible factors before attributing vomiting to the milk formula alone. Air-swallowing is a very frequent and simple explanation for much of the vomiting which occurs. Too much excitement at time of feeding, with too much handling of the infant may be another simple explanation. Vomiting occurs with many of the infections in infancy, particularly those outside the gastro-intestinal tract. In any case of vom-

ing which does not respond to simple measures, it is necessary seriously to consider the possibility of mechanical obstruction. In infancy, vomiting is seldom due to intracranial pressure alone. Very frequently, cases of persistent vomiting are met, in which there is a normal weight gain, and no evidence of nutritional disturbances despite the persistent vomiting. In these cases, the symptom seems to be a constitutional characteristic, and as such may have to be overlooked as much as possible.

Constipation

A common complaint when boiled whole milk formulas are used. Infrequent with evaporated milk formulas.

Underfeeding.

Tight rectal sphincter.

In combination with vomiting suggests obstruction.

Megacolon.

The symptom, constipation, is of common occurrence when boiled whole milk formulas are used. In evaluating the symptom, constipation, it is necessary to consider not only the number of stools, but more especially, the consistency and amount of moisture of the individual bowel movement. Often the so-called constipated baby is having normal stools, but not as frequent stools as the mother feels is necessary. Constipation is not frequently met with, when evaporated milk formulas are used. Underfeeding is a frequent cause of constipation, particularly in the breast-fed baby. In every persistent case of constipation, a tight rectal sphincter may be the underlying cause. In association with vomiting, constipation should suggest the possibility of obstruction. A gastrointestinal X-ray series is indicated to rule out this possibility. In connection with persistent constipation, megacolon should not be overlooked as a possibility.

Diarrhea

With clean, boiled milk and proper refrigeration, diarrhea is rarely due to milk formula alone.

Starvation diarrhea.

Infections—G. I. or parenteral.

External heat—hot weather or excessive clothing.

Diarrhea due to milk formulas is much less frequent than it was in the past. The use of clean milk, boiled in the preparation of the formula, and kept properly refrigerated until the formula is fed, has greatly decreased the incidence of diarrhea. One of the forms of diarrhea which may not be recognized is starvation diarrhea. The characteristic of this form of diarrhea is the passage of frequent, small, greenish stools, consisting mainly of mucus and bile. The possibility of this condition should always be borne in mind in the treatment of diarrhea, since it is quite possible by improper management to convert a mild diarrhea into a starvation diarrhea by prolonging the underfeeding period too long. The most severe diarrheas are those associated with infections, more frequently outside of the gastro-intestinal tract than of enteric nature. Careful search for parenteral infection should be made in every case of diarrhea. The occurrence of diarrhea during the hot sum-

mer months has markedly decreased. The dreaded cholera infantum of past years is met with frequently in large cities; but is a rare occurrence in smaller communities. This type of diarrhea is the one in which the dangers from dehydration and acidosis constitute the chief threat to the child's system.

Failure to Gain

Individual growth potentialities are determined by heredity.

Underfeeding—frequent cause.

Search for organic basis.

Congenital defects of heart, kidney, liver, endocrines, C. N. S.

Repeated infections.

Chronic infection.

Deficiency diseases.

Lipoid pneumonia.

Poor hygiene.

Often associated with

Anorexia

Any of above causes may be operative.

Psychic effects of forcing food.

The symptom, failure to gain, is troublesome to any one handling infant feeding cases. It is important to remember in connection with this complaint that the individual growth potentialities of an infant are determined by heredity. The most frequent cause of failure to gain is underfeeding. Underfeeding at the breast is probably more frequent than underfeeding by artificial means. If an adequate diet is being offered the child, and normal weight-gain does not occur, and, if there are no digestive symptoms to explain the slow gain, a very careful search must be made for an organic basis for the difficulty. This may be found to be in congenital defects involving the heart, kidney, liver, endocrines or central nervous system. The organic basis may lie in repeated infections, particularly of the upper respiratory tract, especially the nose and ears. Repeated infection usually plays a larger part in retarding weight-gain than do the chronic infections, such as tuberculosis and syphilis. These two conditions must always be ruled out, however. Deficiency disease, involving particularly mineral disturbances, may be the underlying cause, and a careful history of the maternal diet, the maturity of the child, and the mineral content of the diet may give leads, making possible a suitable management for the condition. One of the conditions which may very easily be overlooked, and which may be responsible for this symptom is lipoid pneumonia. This condition probably occurs much more frequently than is recognized. It is usually the result of injudicious use of oily nose drops, or the attempt to choke cod liver oil down a resistant child's throat. A last factor, which is almost always associated with failure to gain, is poor hygienic surroundings. This factor explains the greater incidence of failure to gain in clinic practice than in private practice. Failure to gain is usually associated with anorexia. Any of the causes enumerated above may be operative in producing this symptom. In addition to these causes is the matter of psychic insults which result from forcing

food upon a child who has no physiologic desire for food.

Symptomatic Treatment

For Vomiting—elevate head of crib, gastric lavage, atropine, thick cereal feedings.

For Diarrhea—initial period of starvation, skimmed milk plus casein, or powdered protein milk; paregoric indicated *only* for pain; raw apple diet seldom necessary in infancy.

For Constipation—addition of malt soup, rectal examination, prune juice; laxatives seldom needed.

For Anorexia and Failure to Gain—Lactic acid formula, Vitamin B preparations, minerals (iron, calcium, phosphate), insulin.

In the management of the symptoms which we have discussed, it is necessary always to bear in mind the general principles previously enumerated.

Treatment of the more persistent feeding disturbances resolves itself into two considerations: symptomatic treatment designed to relieve the condition, and systematic investigation to determine the underlying cause. In connection with vomiting, the usual symptomatic treatment is to elevate the head of the infant's crib, in order that the position may favor easy relief of gastric distention and prevent the ready expulsion of the stomach content; gastric lavage for the purpose of determining the emptying time and removing any mucus which may be in the stomach; the use of atropine pushed to produce a physiological response, bearing in mind the possibility of toxic effects characterized by flushing of the skin and hyperpyrexia; or the use of elixir phenyl barbitol as a sedative to produce relaxation through general effect; and lastly, the use of thick cereal feedings. The investigation of the case which must be carried on before the symptom has progressed to the extent that dehydration has occurred consists largely in fluoroscopic and roentgenographic examination of the stomach to determine the rapidity of emptying in order to rule out the possibility of congenital defect or obstruction.

The symptomatic treatment of diarrhea involves the use of an initial period of starvation of from 12 to 24 hours, followed by a diet of high protein content; the use of either boiled skimmed milk to which casein has been added or the use of powdered protein milk after the initial starvation with a gradual return to an adequate diet for the individual child. Paregoric should be used only to relieve pain, and should not be employed in doses sufficient to stop peristalsis. The raw apple diet which has been so much in evidence in recent literature is seldom necessary in infancy. In fact, it is a treatment which is viewed with tremendous suspicion by mothers. For this reason alone it is not practical. In addition, it must be said that the raw apple diet has not become well-established in general pediatric practice. The investigation of the case to determine the factor underlying the diarrhea consists largely in a thorough search for any source of infection, and adequate treatment for the source, when determined. The necessity for main-

taining the child's fluid and mineral balance is of utmost importance. On the use of subcutaneous injections of normal salt solution, intravenous glucose plus transfusions, whenever indicated, may depend the ultimate outcome of the particular case.

The symptomatic management of constipation depends upon the administration of a more laxative type of formula. The change from whole milk to evaporated milk may bring decided improvement. The use of carbohydrates containing higher percentages of maltose is advisable or a similar effect may be obtained by the addition of malt soup to the formula. The use of prune juice may be of some value. Laxatives are seldom needed in the management of constipation in infancy, though in certain instances, it may be necessary to employ mixtures of mineral oil and agar-agar. The investigation of the case should include a rectal examination for the presence of a tight rectal sphincter, and in persistent cases the use of barium enemas to rule out the presence of megacolon or minor obstruction in the large intestine.

The management of anorexia and failure to gain is usually the most difficult problem in infant feeding. Those cases in which underfeeding has been the primary cause will usually respond quickly to an increase in the diet. The use of measures designed to increase the digestibility of the milk formula, particularly the use of lactic acid are well accepted procedures for these cases. The addition of vitamin B to the diet may be of help in some cases. In every case emphasis should be laid upon the mineral content of the diet, particularly the content of iron, calcium, and phosphorus.

The use of insulin to stimulate appetite may occasionally produce good effects, but procedures of this kind are best carried out in hospital practice. Hospitalization for these infants is usually not recommended, although a change of environment may be helpful. The most important point in the management of these cases is to rule out all organic disease. If none can be found, the factor of hereditary type of body build may be acceptable as the explanation for the symptom, and a slow gain may be entirely compatible with health. In the recognition of the types of body build associated with slow gain, the tables of Lucas and Pryor, in which the intercrystal diameter is coordinated with height, may be of value in determining the infant's growth potentialities.

To summarize a discussion of this kind would scarcely be feasible. It would be more practical to stress again the more important considerations. It is to be emphasized: first, that most feeding difficulties are not actually problems in devising an acceptable formula but partake more of the nature of correcting defects in the formula or feeding technic. Second, that frequent changes in the formula accomplish very little. Third, that simple measures based on physiologic concepts will solve many minor feeding problems. Fourth, that organic disease or abnormality must be sought in any case which fails to respond to these simple physiologic measures.

The Treatment of Burns*

W. A. Wright, M.D.

Williston, North Dakota

BURNS are accidents, therefore, emergencies, and require prompt emergency treatment. It sometimes happens that in emergencies the early treatment tends to be hurried and not carefully considered. Again, in burns, there is the urgent desire of the patient and friends to get something on the burned area at once. So it is desirable to have fixed in one's mind a more or less routine method of procedure which is set in motion immediately a case is seen. Naturally, as burns vary in extent and depth, treatment must also be adapted to suit each case. In this outline of treatment I do not intend to suggest that each procedure is always necessary.

Burns, being accidents, can occur at any time or place, and frequently some time elapses before medical aid can be given. The individual suffering severe pain seeks and requires some immediate help. Usually, relief is sought from the intolerable smarting pain by some form of local application, generally an ointment. Because a simple ointment such as petrolatum eases the smarting of a superficial burn, it by no means follows that it is a suitable substance to apply to a deeper one. Rose¹ in a recent article offers what has seemed to me to be a very satisfactory immediate treatment. He points out that immediate application of cool tap water will give a large measure of relief. In local burns covering a small area, he uses cool wet applications; and in severe burns he puts the patient, clothes and all, into a tub of water. This simple first aid treatment might well be utilized prior to the arrival of the doctor or of the patient at hospital or office.

Usually, when first seen, a burned patient will be suffering severe pain and will be in a state of from mild to severe shock. While it is desirable to inspect promptly the burned area, actual treatment of it may be delayed for a few minutes until measures for relief of pain have been instituted. Morphine should be injected at once and may, on occasion, be given intravenously, when relief will be very prompt. The burn is protected with sterile dressings or towels and the patient is covered with blankets. Additional warmth may be secured by hot water bottles or heat from electric lamps, and the head may be lowered by raising the foot of the bed. Warmed fluids should be given by mouth, subcutaneously or intravenously. In giving fluids one must remember that frequently kidney function is depressed and care must be taken not to overload the body with excess fluid. Tissue edema may easily be produced. Intravenously one may give saline, dextrose, six per cent acacia or blood transfusion. Blood transfusion is probably of more value in the secondary shock, arising a day or so later supposedly from absorption of tissue products, than in primary shock caused by the initial injury.

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In the care of the burned area, every effort is to be made to avoid infection. The burn and surrounding skin should be cleaned thoroughly with soap and water. Ether or benzene may be used to remove grease. If necessary, a general anesthesia should be induced. Following cleansing, blisters are opened and all loose epithelium carefully removed. This will leave a raw surface ready for a protective covering. Care of this raw surface has always been the main problem, and has been met in many ways. Prior to 1925, it was usually covered with some sort of oil, ointment, moist application, or occasionally it was left uncovered and exposed to heat. In Europe at the present time, cod liver oil dressings are greatly favored, Loehr² and Steele³ considering them far superior to all others. In this country since the introduction of the tannic acid spray by Davidson⁴, some form of coagulation or crust formation has been generally used. The aim has been to secure a thin dry crust by coagulation of the overlying dead tissue, forming a firm protective coating. Originally Davidson applied tannic acid solution by means of frequent sprays. Later, Coan⁵ used ferric chloride, Aldrich⁶ gentian violet, and Narat⁷ brilliant green. A plan of tanning has been developed by Bettman⁸, which is, I believe, the most satisfactory at present. Using his method, a fresh five per cent solution of tannic acid is applied with ordinary cotton applicators. The entire raw surface receives a liberal amount of tannic acid solution resulting in a greyish-white layer of coagulum. After removal of any excess tannic acid solution, application of ten per cent silver nitrate completes the process. It is well to remember that a silver nitrate swab should only be used once, because getting tannic acid mixed with the silver nitrate will cause precipitation. Inside of 30 minutes, or less if dry heat is used, a fairly pliable coagulum forms. The part may then be protected from the bedding by a cradle, and it is well to have one or two electric lights under the cradle. The advantages of this method over the use of the spray are readily apparent. Bettman⁸ has an article in the May first issue of the *Journal of the American Medical Association* in which he points them out at some considerable length. He considers that most of the general body reaction to burns occurs as a result of loss of circulating fluid. Immediate tanning unquestionably reduces or entirely prevents this loss, depending on the amount of time lapsing between the time of the burn and its application. Infection rarely occurs because of the early drying and the antiseptic action of silver in the coagulum. As there is only the one application, there is very much less chance of destroying viable epithelium.

It is important that the tannic acid solution be freshly prepared. This may be conveniently cared for by having the correct amount of powder weighed-out and left in

a stoppered bottle. Then when required, a solution can be quickly prepared by adding the proper amount of distilled water. The silver nitrate crystals may be weighed out and kept in a similar manner. If one has to prepare a solution in a hurry, adding one tablespoonful of tannic acid to one ounce of water will give approximately a five per cent solution. A half teaspoonful of silver nitrate to an ounce of water makes a ten per cent solution. As a matter of fact, the percentage of the solutions may vary within wide limits and still be effective. Wilson⁹ uses tannic acid in 20 per cent solution; Davidson originally recommended 2½ per cent solution. I have used silver nitrate in a one per cent solution and found it satisfactory.

While this is generally considered to be a safe and rational form of treatment, satisfactorily used and recommended by most writers, it should be pointed out that not everyone agrees. Taylor¹⁰ in an article entitled "The Misuse of Tannic Acid" disagrees with the original contention that tannic acid coagulates only dead tissue. He makes the pertinent observation that the fact that tannic acid has no effect on the epidermis does not prove that cells of the deeper layer may not be destroyed. He contends that tannic acid or other coagulation applications result in destruction of many cells of the germinal layer and of the hair follicles, which otherwise are viable, so that healing may be actually delayed. While this may be true, the many practical advantages of coagulation make it the accepted treatment at the present time.

If infection develops under the crust or spreads to adjacent tissues, hot wet dressings should be used and continued until the infection subsides. The coagulum will have been removed by wet dressings, or sufficiently loosened to remove by forceps, leaving a raw area perhaps bathed in purulent secretion. Further moist applications of boric acid or Dakin's solution may be used. If the latter is used, the skin should be protected by vaselined gauze. Then the raw surface may conveniently be covered by repeated coatings of one per cent gentian violet solution which will form a new thin coagulum. This may be applied as often as necessary, and will form an efficient covering and aid in clearing up the infection. I believe gentian violet is a particularly useful covering where there is low grade infection, and will tend to reduce the amount of scarring when final healing occurs.

If there is no infection, the coagulum tends to loosen in six to 12 days leaving either a healed skin surface or clean granulating areas depending on the depth of the burn. Small granulating areas may be left to heal from

the edges, being covered by a gentian violet crust or simple vaseline gauze. Large granulating surfaces should receive skin grafts, and are usually ready for grafting within three weeks. The exact type of graft will depend on the location, size and relative sterility. Thus small, so-called pinch grafts may be successfully used over large areas where there is some low grade infection, whereas a full-thickness graft requires practically a sterile bed. The important consideration is that every effort should be made to secure early epithelial covering of all raw surfaces. It is in those wounds which have escaped infection that most rapid healing, with or without skin graft, will occur. So, from the very beginning of treatment until the burn is entirely healed, every reasonable effort must be made to prevent infection. One should also be on the alert to recognize infection in early stages, and to institute prompt treatment.

Burns of special regions such as the face, neck, axillae, groins, and other flexures require more careful attention than burns in other areas. I believe the tannic acid-silver nitrate treatment can be used satisfactorily in most of these special situations. However, in certain folds such as about the perineal and anal region, sometimes in the axillae and about the neck in obese individuals, there is an excess of moisture, and one has difficulty maintaining a satisfactory dry crust. Use of dry hot air may help, but this cannot be continued indefinitely and it may be necessary to use in these areas a vaseline gauze dressing. Burns of the face should be treated by a tannic acid jelly. Silver nitrate should not be used because of the possibility of residual pigmentation. Where joint regions are involved, splinting may be required, but when possible, early active motion is to be preferred.

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The Results of Routine Examination*

Of Candidates for the Teachers Certificate at the University of Wisconsin

Llewellyn R. Cole, M.D.†

Madison, Wisconsin

THE PROGRAM of examining each candidate for the University Teacher's Certificate here at the University of Wisconsin has been in progress for only the past two years; but has clearly demonstrated its value in a multitude of ways. The discovery of remediable defects and suggestions for their correction should be primary functions of a student health service, which in itself implies a patient constituency of a very excellent age-selection, where the morbidity is exceptionally low. However, some of the group are on the lower fringe of middle age, and the wear and tear of time and physiological changes need checking in order that the individual does not allow some process to pass out of the controllable stage. This has been the objective in this group of examinations.

Under the stress and strain of college life—possibly the necessity for partial or total self-support in addition to the duties and obligations of a student in his academic pursuits—the health of the individual may suffer, sometimes to a marked degree, and decidedly to his physical disadvantage. There may develop an incapacity of serious consequence which, if allowed to proceed, may be the physical or mental undoing of the individual and seriously impair his capabilities as a wage-earner. Persons who plan to follow educational pursuits for any length of time, and as a consequence intimately associate with groups of younger people, should of necessity be in relatively good health, both mental and physical, as an implied obligation to the community in which they are employed. Communities are gradually requiring more substantial evidence of good health than the mere statement of the individual, and the obligation is reflecting itself upon our colleges and universities. Examples of the type of physical problems which present themselves are tuberculosis, nervous disorders, thyroid dysfunction, heart disease, and to a lesser degree, changes in vision and hearing. If recognized at a sufficiently early date, these are usually correctible or amenable to proper therapy; or at least the course of the affliction may be so altered as to render the individual eligible for more normal living, as in the case of diabetes mellitus.

In a survey of 261 individual senior students made during the school year of 1936-37, many interesting observations were made. The examinations were performed on all of the seniors in the School of Education in the University of Wisconsin, with the idea of giving to each individual a thorough physical inventory before granting him a clean bill-of-health, and sending him forth into

the communities of the state and the nation to instruct the next generation in the many pursuits required in the present day educational system. In this group of 261 students, there were 181 females and 80 males. The males were largely classified as physical education students who were qualifying for coaching positions and similar situations in the teaching profession. All these persons had been previously examined and given a physical grade representing our estimation of their physical qualifications and limitations. In addition, all who had not previously had the advantage of the Mantoux test, or those who had previously shown negative reactions, were tested or retested with a weak and a strong dose of Old Tuberculin (in the event of a negative reaction to the weak dose). The positive reactors, numbering 114, were all studied with the X-ray and fluoroscope¹. It is interesting to note that the percentage of positive reactors among the newly entering students at the university is approximately 28%†, but that the percentage has jumped to about 44% in this group of seniors, indicating that there had been exposure to the tubercle bacillus in many of these people during the interval between freshman and senior years. There were doubtful reactions to the large dose of Old Tuberculin (1.0 mg.) in three cases, and in one case the candidate refused the Mantoux test. The X-ray studies were essentially negative in 87 cases, but 27 individuals showed roentgenologic evidence of pulmonary pathology to a greater or lesser degree. These changes included such pathology as primary complexes or Ghon tubercles, calcified glands in the hilum or elsewhere in the chest, apical "caps," pleural reactions and healed lesions in the lung parenchyma. The pleural changes consisted of thickening, or adhesions, in some cases with involvement of the diaphragm. One case showed gross and definite evidence of an early but active tuberculosis. The Mantoux test had been negative in both the weak and strong doses of tuberculin in September, 1935; but in December, 1936, showed a positive reaction to a dose of 0.1 mg. O.T. The X-ray studies revealed a tuberculous pleurisy with a minimal subpleural parenchymal infiltration at one apex. This patient withdrew from the university for an extended period of rest at home (90037). If this patient had been allowed to continue in the university, no one can determine how many other persons would have been unwittingly exposed; and had the patient been sent out to teach there can be no prediction as to the number of pupils who would have been exposed

* Examinations performed by Dr. Chalmer Davee, of the Department of Student Health, University of Wisconsin.

† Director, Department of Student Health, University of Wisconsin, Madison.

1. Personal communication from Dr. R. H. Stiehm regarding figures on positive reactors in 1936-37. Also see: Stiehm, R. H., Tuberculosis Among University of Wisconsin Students. The American Review of Tuberculosis, Vol. XXXII, No. 2, August, 1935, pp. 175-176.

to this case of minimal tuberculosis which might well have become active, with widespread dissemination of the tubercle bacilli. The economic and social consequences of such an unfortunate situation can only be contemplated. The entire program is justified by the discovery of this one single case of tuberculosis, if for no other reason.

We, of the Department of Student Health, are strongly of the opinion that protection against smallpox is still an extremely important phase of preventive medicine, and that the disease should continually be guarded against. This is particularly true in those cases where individuals are going out into widely scattered communities to be exposed to all types of diseases. This applies to school teachers as well as others, and we urge vaccination for all individuals in the university. Each candidate for a teacher's certificate is vaccinated against smallpox unless some religious objection or equally valid scruple exists. Most of the members of the group had been previously vaccinated, and 167 had "immune" reactions. Eighty-nine persons showed reactions in the form of "takes." Five persons were not vaccinated.

Routine urine examinations were done in each case, and one diabetic was discovered and put under treatment. In the event that sugar, albumin, blood cells or casts were discovered, further studies were made. The value of such a procedure is self-evident.

Ten cases of heart disease were noted, of which seven were definitely of rheumatic origin, one was a congenital heart lesion, and two others were cases of hypertension of doubtful origin. Eleven functional murmurs were noted in addition to the above. Where there was any question as to the condition of the cardiovascular system, an orthodiagram and an electrocardiogram were obtained through the courtesy of the Department of Cardiology of the Wisconsin General Hospital, along with the opinion of the cardiologist as to the cardiac situation. Several cases were reported as having cardiac enlargement as evidenced by the chest X-ray, and each of these was carefully checked by orthodiascopic study.

One hundred cases of enlarged and palpable thyroids were noted, and where indicated a basal metabolic rate determination was done. One case of adenomatous thyroid was found, and in all cases the patient was advised as to the future course of procedure.

In the matter of vision I am indebted to the National Society for the Prevention of Blindness and to Annette M. Phelan for suggestions as to procedure and the education of the future teacher in matters relating to vision and eyesight, and their preservation. Many teachers must perform vision tests upon children, and so must know the methods of testing. We use a testing chart made up of the letter "E" placed in one of four positions. The opening of the letter may be to the right or left, up or down, and the individual tested must respond with an answer indicating the direction of the opening of the letter. The ordinary type of vision chart is also used. Sixty cases of myopia were noted, six of

which were not corrected, and eleven cases of hyperopia were found, of which two had not been corrected. (It is to be noted that the vision testing was done on less than one-half of the group, as it was a later addition to the examination.) Education in matters of vision is essential to the future school teacher. We can advise as to whether further changes in lenses are indicated, but we do none of the refractions, feeling that this is a function of the private physician trained in the correction of pathology of the visual apparatus.

One individual was passing through her menopause and had had an amputation of a breast (84932).

It is to be hoped that another year will see the introduction of simple tests for auditory acuity into this rather comprehensive physical inventory of the individual, inasmuch as this is such an important member of the group of senses. I sincerely hope that more can be done in the evaluation of the psychic endowment of the student who is going out to instruct by precept and pedagogy the youth of the next generation of the country, at a not too far distant date. Some individuals are psychologically unfit to teach, and the time to tell them is before they begin.

In summary, attention should be called to the several facts brought out by this survey.

1. All seniors in the School of Education at the University of Wisconsin are given a thorough physical check-up before graduating, including Mantoux testing, X-ray study where indicated, and routine smallpox vaccination.

2. One case of tuberculosis and one case of diabetes were discovered in these examinations, numbering 261.

3. Vision testing is calling attention to defects in the individual's vision and at the same time instructing in the nature of simple vision tests.

4. It is to be noted that the number of positive reactors to the Mantoux test has increased from 28% to 44%.

5. Heart disease can be discovered or re-evaluated in such a procedure and advice given to the mature individual as to the future course and conduct of his or her life. This can be done with much greater success to the group of seniors than to the same group of freshmen.

6. The females outnumber the males in the group by more than two to one.

7. A routine psychiatric inventory and evaluation would make a valuable addition to this type of examination of future school teachers and result in a reduction in the number of misfits. This was clearly demonstrated by the results last year when such service was given.

8. This procedure has a fixed and definite place in the practice of preventive and prophylactic medicine as contrasted to remedial.

9. Simple tests for hearing are indicated in this type of examination.

Brucellosis*

N. M. Levine, M.S., M.D.,† and J. Arthur Myers, M.D., Ph.D.,††

Minneapolis, Minnesota

and

Elizabeth A. Leggett, M.D.,†††

Kent, Ohio

BRUCELLOSIS (undulant fever) can be defined as a mild septicemia caused by *Brucella* organisms and characterized by a reaction of the reticulo-endothelial system. It would seem somewhat odd to talk about this disease in the presence of men interested in lung diseases. But as a mild septicemia, there is involvement of the lungs and pleura which may be so mild and indistinct in character that it may be missed entirely or misdiagnosed. In fact, brucellosis comes to the attention of every specialist. Its striking feature is the presence of an afternoon fever. Its strikingly ignored symptom is weakness. In the late 19th century before the actual significance was known, the fever was named after the locality in which it was found, such as Malta fever, because there was an epidemic in Malta; likewise Mediterranean fever, and Cyprus fever. The clinical picture was first described by Marston in 1861¹, but the bacterium was not found until 1887, when Bruce² cultured the spleen of his patients and found an organism which reproduced the disease. How this organism reached the human body was not discovered until 1904, when the Mediterranean Fever Commission traced the source to raw infected milk of goats. Elimination of raw goat's milk stopped the spread of the disease. In 1918, while classifying bacilli, Evans³ found that Bruce's organism was almost indistinguishable from another organism discovered by Bang in 1897 to be the cause of abortions in cattle. And these two organisms were similar to one found by Traum in 1914, and Good and Smith in 1914 in hogs. These three organisms not only are closely related in form, cultural growth and ordinary agglutination tests, but they cause practically the same disease in man. Therefore, at the present time all three organisms are called *Brucella*, i. e., *Brucella melitensis* from goats; *Brucella abortus* from cattle, and *Brucella suis* from hogs. These organisms are found in the organs of the animals, including fetus and placenta⁷; in the secretions as milk, on the surface of the udders, and in their excreta⁷. At present Malta fever is not named after the locality in which it is found, but is named after the chief clinical finding, "undulant fever." The most recent authors, however, tend to name the fever after the cause, "brucellosis."

The only two proven ways by which man may become infected with these organisms is by contact or through ingestion of raw infected milk and its products^{9,10,11,12,13}. Many cases have been reported in which the source of infection was traced to raw milk from infected

herds. School children drinking milk from abortus-free herds were negative to agglutination tests, while a high percent of those fed on market milk were positive reactors²². Contact is proven by the presence of rashes on the hands, undulant fever and positive agglutination tests in veterinarians, slaughter-house workers, and farmers. Twenty per cent of the cattle in the United States are infected⁷³. The percentage of infected cattle varies with epidemics as is shown by testing certified herds in Los Angeles County⁵. In 1927 there were 33.7 per cent positive agglutination tests for undulant fever. Repeating the test in 1932 only 0.34 per cent were positive. The per cent of infected raw milk roughly corresponds to the per cent of infected cattle. In Edinborough Beatty⁶ showed *Brucella abortus* in 34.9 per cent.

When brucellosis was first recognized in the United States it was found in the goats of Texas in 1905. Since that time there has been a definite spread of the disease northward and eastward, with a marked increase in the number of reported cases. Millett²³ gives the following summary: from 1905 to 1925 one hundred and twenty-eight cases were reported; in 1925 twenty-four cases; in 1926 forty-five cases; in 1927 two hundred and seventeen cases; in 1928 six hundred and forty-seven cases; in 1929 nine hundred and fifty-two cases; and in 1930 one thousand three hundred and eighty-five cases. In Minnesota forty-five cases were reported in 1929; sixty-four cases in 1930; seventy-two cases in 1931; sixty-seven with three deaths in 1932; and seventy-one with no deaths in 1933. The apparent peak of infection occurs during the summer months²⁴.

Brucellosis is more apt to follow contact with infected animals than after ingestion of infected milk, as shown by the following facts:

(a) 13 per cent⁶⁶ to 17 per cent^{21,22} of children drinking market milk are positive to agglutination complement fixation tests. Only 1 per cent of children developed actual disease from drinking infected milk⁶⁶.

(b) Hasley⁴ found that *Brucella abortus* organisms could not be found in the milk of cows whose agglutinations were positive in the blood serums in less than 1-100 dilution. Assuming that the agglutination signifies presence of active infection, this would mean that not all infected animals excrete the bacteria in their milk. Only 40 per cent of infected cows excrete *Brucella* in their milk⁷³.

(c) The male sex is attacked twice as frequently as the female⁶⁴.

(d) The age curve in undulant fever shows the disease to prevail most commonly between the ages of 20-44 years. In 442 cases listed by Hasseltine¹³ only 3 per

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† Assistant in medicine, University of Minnesota.

†† Professor of medicine, University of Minnesota.

††† Kent State University, Kent, Ohio.

cent occurred in children under ten years of age. In smaller groups the percentage rose to 13 per cent⁶⁶.

(e) Agglutination tests made on routine Wassermanns show that there were eight times as many positives in veterinarians, farmers and slaughter-house workers as in those of other occupations. In veterinarians, farmers and slaughter-house workers 54.7 per cent are positive to skin test⁶⁵.

When the bacteria attack the human either by contact as indicated by the maculo-papular rash on the hands of veterinarians, or through the drinking of raw milk there begins a period of incubation which lasts between five days and three weeks, after which time appear the septicemia and the resulting reticulo-endothelial reaction which characterize undulant fever.

The reaction of the reticulo-endothelial system is either nodular or generalized. In animals and in the few postmortems⁵⁵ of humans in undulant fever, one may find greyish uniform millet-seed size nodules which may resemble the tuberculous tubercle. On microscopic examination these nodules consist of granular and fatty epithelial cells and giant cells. In larger nodules PMNs and capillaries can be seen in the center. Although necrosis may occur, especially in the nodules of the liver, caseation never appears as in tuberculosis. More rarely in these nodules, one finds plasma cells, fibroblasts and lymphocytes. The general reaction of the reticulo-endothelial system consists grossly of a congestion of all the internal organs which is intense in the acute cases (for example soft spleen), and is less intense in chronic cases (a chronic passive congestion—hard spleen or a nutmeg liver). The blood shows usually a relative or absolute lymphocytosis and a mononucleosis, while the PMNs and platelets decrease. Also, there is development of sensitivity and immunity. The skin is allergic to the injection of dead bacteria. The allergy increases with the duration of contact with *Brucella*⁶³. The blood shows agglutinins which may appear after ten days, but usually after fifteen to twenty-one days. They disappear with the infection either immediately or after three to four months. Immunity is indicated also by the flocculation test of Julian and Laurent; by the opsonocytophagocytic index; precipitans, etc.

Brucellosis may persist three to four months. In rare cases the *Brucella* organisms have been recovered from the body after from five to six years (in ovarian cyst—Wainright, 1929). The disease is usually mild. Up to 1929 no deaths were reported in Switzerland. In exceptional epidemics, one of which is reported by Aubert, Canteloupe and Thebaux, the mortality rose to 40 per cent. In the endemic stage, however, the actual number of deaths do not exceed approximately 3 per cent. Depending on the severity of the attack, undulant fever is subdivided into five types: (a) subclinical, in which agglutination tests are positive but no clinical findings are present; (b) intermittent 55 per cent; (c) ambulatory type 25 per cent; (d) relapsing type 15 per cent; (e) fatal cases. The majority of cases remain unrecognized¹⁰. Symptoms in the acute stage of the septicemia and reticulo-endothelial reaction are fever, weakness,

chills (90 per cent), sweats, generalized aching, backache, joint pain, rigor, dizziness, abdominal pain, nausea, vomiting, cardiovascular disturbances and joint swellings. The physical findings vary with the locality where the infection predominates, and the severity of the reaction. The physical findings may be listed in summary as follows:

1. Heart: ulcerating endocarditis and findings of valvular lesions.
2. Spleen: enlarged; soft at first, hard later.
3. Liver: may be enlarged, soft at first, hard later, resulting in ascites, jaundice and varicose hemorrhages. Very large necrosis may lead to sub-diaphragmatic abscess.
4. G. I. tract: hemorrhage from ulcerating Peyer's patches. Peritoneal abscesses.
5. Joints: swelling.
6. Bones: destruction, osteoarthritis, mediastinal abscess.
7. Uterus: abortion.
8. Ovary: cysts.
9. Testis: orchitis.
10. Kidney: nephritis; uremia.
11. Lung: pleurisy, dry or with effusion; bronchopneumonia.
12. Brain: psychosis; neurasthenia.
13. Meninges: hemorrhage, and pus⁷⁰.
14. Skin: maculo-papular rash 5 per cent; petechiae.

When brucellosis becomes chronic, the one constant symptom is weakness; fever may not be present at all. The symptoms are confused with neurasthenia⁷² because there is exhaustion, insomnia, irritability and complaints of aches and pains for which no objective signs can be found.

Considering the organs involved, one realizes the number of similar diseases that arise in the differentiation. The diagnosis is made on the history, the symptoms and findings, and the laboratory tests. Since undulant fever is a septicemia, the *Brucella* organisms can be and are found in blood, urine, feces²⁹ and spinal fluid^{30,52,70} by cultures or by animal inoculation. Since the organisms elicit a reticulo-endothelial reaction, evidence of immunity appears. A positive agglutination test in a dilution of 1-80¹⁰ or 1-100²⁷ is sufficient for diagnosis of active infection. An agglutination of 1-50 would be considered suspicious (Maxey). Agglutination is absent entirely in 16.6 per cent (Burnet). Since the reticulo-endothelial system reaction leads not only to immunity but to allergy, skin sensitivity tests are also useful in diagnosis³¹. An injection of heat-killed suspension of bacteria is used. The intradermal test is not valuable in diagnosing active disease^{63,66}, thereby resembling the tuberculin test. Huddleson's opsonocytophagic test is an indication of the degree of human resistance.

In 1936 Bogart reported four cases of undulant fever with pulmonary changes. The X-ray findings showed a marked widening or infiltration of the hilum and a marked peribronchial infiltration especially in the bases. One fatal case had bronchopneumonic consolidation at

the bases. An autopsy showed slight ascites, subacute gastritis, chronic splenitis, chronic hepatitis, and localized pneumonic consolidation in the right lung. Microscopic examination revealed bronchopneumonia and multiple granulomas of the spleen and liver. Culture of the lung, spleen and bile revealed the bacillae abortus. Richard Johnson⁶⁸ reports three cases of pneumonia in undulant fever at the University of Minnesota. All three cases had positive agglutination reactions. Two were in contact with infected animals. X-ray of each showed a chronic nontuberculous shadow suggesting unresolved pneumonia. In no case were *Brucellae* isolated from the sputum.

It is very common to confuse cases of undulant fever with tuberculosis and cases have been referred to the sanatoriums for treatment (Frik and Briskman). This is due to the similarity of symptoms and the course. We also wish to present four cases that were brought to our attention because tuberculosis was suspected.

The first patient, L. H., was diagnosed by Dr. F. Callahan. He was a farmer boy 16 years of age. He had not been exposed to tuberculosis as far as he knew. The family was drinking raw milk from cows, two of which had positive reactions to tuberculin six months previously, and in one of which there had been one spontaneous abortion. Illness began March, 1930, and on April 27th examination revealed a temperature of 101.2 degrees; a palpable spleen and slight enlargement of the epitrochlear inguinal and axillary lymph nodes. Laboratory examination revealed 3,390,000 RBCs and 6,700 WBCs of which 44 per cent were PMNs and 46 per cent lymphocytes. The RBCs presented central pallor; some nucleated RBCs were found and there was slight anisocytosis. Occasional eosinophiles and basophiles were found. Agglutination was present in 1-1280 dilution when tested with *Brucella abortus* antigen. The tuberculin test was negative. Physical examination and stereoscopic X-rays of the chest showed no definite evidence of pathology. He was treated symptomatically.

The second patient, L. S., was a salesman 27 years old with no known exposure to tuberculosis. On August 24, 1931, he complained of severe pain in the left side of his chest, dull pain in the lower back, loss of nine pounds in weight, weakness and fever. A chiropractor had made a diagnosis of cystic fluid on the chest. These symptoms had been present for two months. The laboratory examination revealed a hemoglobin of 90 per cent, 4,600,000 RBCs, 7,200 WBCs, and a negative Wassermann. The patient failed to react to 0.1 mgm. of tuberculin but had a three plus reaction to 1.0 mgm. Physical examination and a single X-ray of the chest revealed no evidence of pulmonary pathology. On August 26, 1931, agglutination for *Brucella abortus* antigen was present in a dilution of 1-1280. Feces and urine culture for *Brucella* organisms showed no growths.

Treatment was started using methyl violet in 10 mgm. doses in keratin-coated capsules five times a day. A retention enema of 300 cubic centimeters of 1-50,000 solution of methyl violet was given daily. He was uncomfortable after the first capsule, nauseated after the sec-

Date	Thionine Orally in Salol-Coated Pills	Thionine by Retention Enema
9-25 to 9-27	25 mgm. daily	250 cc. of 1-100,000 solution daily.
9-28 to 9-29	Rest	Rest
9-30 to 10-3	50 mgm. daily	300 cc. of 1-100,000 solution daily.
10-3 to 10-4	Rest	Rest
10-5 to 10-8	50 mgm. daily	300 cc. of 1-50,000

ond, and vomited violently after the third. The capsules were discontinued. On September 24, 1931, the course of treatment described by Leavell, Poston and Amoss⁴⁸ was recommended.

By October 13, 1931, his temperature became normal and he had gained three and one-half pounds in weight. On June 4, 1932, there was no agglutination to *Brucella abortus* antigen in a dilution of 1-40.

The patient W. O., 44 years of age, was a dairy farmer and owned an accredited herd. He had no known exposure to tuberculosis. In December, 1931, one of his cows aborted spontaneously. He removed the placenta with his bare hands. In January, 1932, a second cow aborted spontaneously. On February 5, 1932, he complained of loss of strength during the past year, chills and fever; had night sweats of two months duration; loss of seven pounds in weight in five weeks. For two or three nights his temperature had reached 103 degrees. He stated his illness began one month after the first abortion. Physical examination revealed a temperature of 101, easily palpable spleen and nothing abnormal in the chest. The tuberculin test was negative. The hemoglobin was 85 per cent, Wassermann was negative. The blood, urine and stool tests were negative for *Brucella* organisms. X-ray examination revealed nothing abnormal in the heart or lungs. His blood agglutinated *Brucella abortus* antigen in a dilution of 1-1280. Up to February 17, 1932, he had been having severe chills followed by a high fever and a feeling of malaise. The same course of treatment was given with thionine as outlined for patient number two. His temperature became normal, although he had lost five pounds in weight.

The fourth patient, W. F., was a 19-year-old farm boy. He had no known exposure to tuberculosis. The cows were negative to the tuberculin test and none of the cows or hogs had had any spontaneous abortions. On entrance to the sanatorium he complained of having had an afternoon fever of 100 degrees since March 1932; of generalized aching; several moderately severe night sweats and loss of fifteen pounds in weight. This patient had been told that he had moderately advanced pulmonary tuberculosis, although no tuberculin tests or X-ray study had been made. Examination on May 16, 1932, revealed no pulmonary pathology on physical or X-ray examination. Tuberculin test was slightly positive. The blood showed a hemoglobin of 85 per cent, 4,200,000 RBCs and a differential of 52 per cent lymphocytes, 38 per cent PMNs, 7 per cent monocytes, 2 per cent eosinophiles and 1 per cent myeloblasts; negative

Wassermann reaction, and agglutination of *Brucella abortus* antigen in dilution of 1-1280. The patient was referred back to his family physician, who later reported that after a course of treatment he had examined the patient and found him free from symptoms.

As in the case of all diseases where the cause is found, attempts should be made to eliminate the disease by prevention, and specific methods should be used if the disease is already present. Prevention of undulant fever would consist of pasteurization of raw infected milk or by the removal of infected animals (experimental immunization of infected cattle has failed⁵⁵). The treatment at the start was naturally symptomatic because the disease usually ran rather a short and mild course. Later on, foreign protein^{44,45} was used, neoarsphenamine²⁵, quinine, dyes like mercurochrome⁴⁹, theonine and methyl violet⁴⁸. These were aimed at the septicemia and were not specific. The best treatment, of course, would be specific treatment: either vaccine therapy^{40,41,42} or use of immune serum obtained from animals⁶⁷ or humans⁶². Both the latter methods have been found successful, although clinical trial has not been sufficiently controlled. Of two cases of meningitis, one treated specifically recovered⁷⁰. Hannock and McGath report two cases in which they used a detoxified serum obtained from horses and goats in which there was a sudden fall of temperature and relief of toxicity. However, the temperature did recur without any toxicity. Cresswell and Wallace⁶² report the use of immunotransfusion in two cases with sudden relief of symptoms and temperature. They took the donors who had undulant fever and whose opsonophagocytic index was high. Even with specific vaccines and serum, recurrence of disease takes place in 11 per cent⁶⁹ to 20 per cent⁶⁷ of cases.

Conclusions

1. Brucellosis is a mild septicemia caused by *Brucella* organisms and characterized by a reticulo-endothelial system reaction.
2. Cases with persistent fever, weakness, relative lymphocytosis should suggest brucellosis.
3. Pulmonary changes may suggest atypical, slowly resolving pneumonias.
4. The history and symptoms may suggest a diagnosis of tuberculosis.
5. Diagnosis of undulant fever can be confirmed or ruled out by laboratory tests.
6. Although our series of cases was too small, and period of observation too short to justify drawing final conclusions as to the success of treatment, thionine was found to give prompt symptomatic relief.
7. In two cases improvement in symptoms was paralleled by a diminished agglutination with *Brucella melitensis* (abortus) antigen.

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Some Allergic Problems Puzzling to the General Physician*

J. A. Rudolph, M.D.†
Cleveland, Ohio

BRONCHIAL ASTHMA, hay fever, urticaria and angioneurotic edema are generally accepted as the commonest clinical forms of allergy, and usually are recognized without especial difficulty. With these obvious varieties this paper is not concerned; but rather with those conditions which are definitely allergic, but are not readily apparent, often being quite difficult to identify.

These vague allergic conditions can be classified into two main groups: (1) atypical allergic complaints, (2) identical complaints shared by the non-hypersensitive patients.

The first really comprises the atypical forms of the usually-evident allergic complaints mentioned above, the identifying signs being so faint, so indefinite, or so intermingled with the symptoms of complicating conditions as to render the allergic features difficult of recognition.

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†Associate clinician, Department of Allergy, Mount Sinai Hospital, Cleveland, Ohio.

The second group contains the allergic varieties of such conditions as eczema, headache, and gastrointestinal disturbances. Here the identification of the allergic status is puzzling, since the symptoms are usually indefinite and non-specific, being very often shared by other non-hypersensitive complaints.

Frequently these vague hypersensitive complaints are linked with the more definite allergic conditions; the history past or present, of an associated bronchial asthma, hay fever or urticaria, may be the clue which establishes the allergic nature of the more obscure complaint. Again, the presence in the family history, collateral or antecedent, of clinical hypersensitiveness is of significance, since it is a fact that the tendency to hypersensitiveness is an inherited, familial trait. The skin tests, cutaneous scratch or intracutaneous, or in dermatitis venenata cases, the contact or patch tests, very often afford conclusive evidence; but in those individuals where the skin reactions prove negative, the allergic basis may be established by studying the clinical symptoms resulting from the test

of placing the patient in contact with the suspected cause. In food allergies, especially, "trial and error" or limited diets are employed.

For convenience, these puzzling allergic complaints may be divided arbitrarily into the following three groups: (1) respiratory, (2) gastrointestinal, and (3) cutaneous.

These groups will be considered separately although often a single patient may possess a variety of these manifestations from a single cause; for example, coryza, gastro-intestinal distress, dermatitis may result from foods such as egg, or chocolate, or nuts.

Respiratory Group

Under the designation "acute colds" are hidden mild allergic reactions, many of which are atypical cases of hay fever, or pollinosis; this is especially true where the significant signs and symptoms (itching and congestion of the eyes, lacrimation, nasal congestion and discharge, and sneezing) are lacking except for one or two of their members. For instance, hay fever with the one symptom of nasal congestion or of headache, or of irritation of the eyes, alone may present some difficulty in diagnosis, particularly where the seasonal limits are indefinite. A young man of twenty-five suffering each spring with a persistent nasal obstruction, without sneezing, lacrimation or irritation of the eyes, was considered as having a case of "spring colds" due to the changeable weather, until the periodicity furnished the clue that led to the diagnosis of tree hay fever proven by a positive intradermal test, and the resultant treatment with an extract of sycamore tree pollen. A young boy of nine years was seen with a conjunctivitis and an episcleritis which occurred late each summer soon after the beginning of the school term and lasted several weeks, being attributed to the increased eye strain after the summer vacation. It had not responded to the usual therapy. There were no nasal symptoms. Since the seasonal limits were similar each year, and corresponded to the autumnal hay fever season, the case was suspected of being atypical hay fever, which was verified by a positive cutaneous test, and the resultant treatment was with ragweed pollen extract.

Attacks of too frequent "acute winter colds" are similarly found to be due to the allergic reaction of the respiratory mucosa to air-borne excitants of environmental origin. These appear in the fall, soon after the individual (usually a child, with added hours indoors after a summer in the open) is often subjected to the heated and often dry air of the home, with its accumulation of dusts, feathers, toilet powders, animal epidermals, etc. Such attacks should be easily identified as allergic, due to the suddenness of their appearance and disappearance, the lack of fever, malaise, and contagiousness, the absence of any mucopurulent or purulent nasal discharge, and the immediate improvement upon correction or change of environment. The cause can usually be determined by skin tests, and perhaps by careful questioning.

These frequently recurring paroxysmal allergic responses readily develop into a persistent form frequently

mistaken for a "chronic cold" or "chronic sinusitis." A young woman of twenty-eight years had suffered for three years with a persistent watery nasal discharge, stubborn nasal obstruction, sneezing, lacrimation and frequent headaches. Several X-ray films had shown light to be poorly transmitted through all the sinuses. Several nasal operations had aggravated rather than lessened the symptoms. The patient was identified as being an allergic case by the following clue given by herself: that a "henna wash" given at a beauty shop always made the sclera and conjunctiva intensely irritated and congested.

By skin test she was found sensitive to henna powder, and improved greatly under the allergic treatment indicated. In all individuals with periodically recurring "colds" it is well to consider the possibility of an allergic background before employing catarrhal vaccines, sinus treatments, or other general non-specific measures. In children particularly, any chronic "cold" or "sinus condition" should be strongly suspected of being basically allergic.

When not treated with specific measures, such purely allergic "colds" by their continued presence, frequently lower the local resistance of the individual, and allow the increase of the bacterial flora of the nasopharynx, thus rendering him susceptible to secondary infection and subsequent complications of the respiratory tract. Thus the exciting principle, the allergic factor, though still present, may be difficult to identify, being overgrown by the secondary bacterial invasion with its attended symptoms. In such cases of long standing respiratory infection, the results of therapy are often most discouraging, even when the allergic agent is recognized and taken into consideration in treatment. This type of case is often associated with chronic bronchial asthma.

In children especially, foods are frequently responsible for nasal and bronchial symptoms which are difficult to classify as allergic. A child of twelve with a history of continuous non-seasonal colds, refractory to all treatments, was otherwise healthy, there being no asthma, bronchitis, eczema or cutaneous symptoms. The one point of significance in the history was that on one occasion, when egg was purposely smeared on an accidental arm burn, it caused violent itching and edema of the entire arm. Eggs were eaten daily, being well-tolerated, with no evident discomfort resulting. Upon removal of egg from the diet, the nasal symptoms promptly and completely disappeared. A mild persistent cough, without nasal, gastric or cutaneous symptoms, may be due to a food, particularly chocolate, fish or nuts. In other instances, concomitant with the nasal discomfort may be pallor, listlessness, fatigue, malnutrition, abdominal discomfort and diarrhea, symptoms of a more profound, gastro-intestinal type of food allergy.

Gastro-Intestinal Group

The allergic gastro-intestinal conditions may be divided according to the reaction time into the immediate type, where the interval between the ingestion

of food varies between a few seconds and two to three hours, and the delayed type when the interval varies between three hours and several days. In the first, immediate type, the symptoms could never be considered as vague. In fact, they are so prompt and usually so marked that cause and effect are easily noted by the patient. An instance of this reaction of acute gastro-intestinal allergy, is the individual who is so sensitive to clams that faintness, nausea, vomiting and diarrhea regularly develop within a few minutes of ingestion. The skin tests with extracts of the offending foods are usually positive. In this rapid type of reaction there may also occur symptoms referable to other systems of the body, such as asthma, urticaria and angioneurotic edema.

This immediate type, with its usually obvious causes, is mentioned to contrast it with the delayed type less frequently recognized, since it is more obscure. Here the interval between ingestion and reaction is greater; often two to three days, the symptoms usually being more prolonged and stubborn. Frequently the symptoms presented are not specific for allergic conditions, as is true in a large group where the major complaint is "indigestion." Anorexia, coated tongue, bad taste in the mouth, bad breath, abdominal distress, feeling of fullness or pain in the epigastrium soon after eating, sometimes nausea, eructations of gas and at times of bitter fluids, vomiting, either spontaneous or induced for relief, from a few minutes to two hours after eating—all these are symptoms which point to organic lesions of the stomach, gall-bladder or appendix. They are, however, at times purely functional, and are due to existing food hypersensitiveness. Seldom does the patient determine the cause in this condition, since the longer reaction-time so confuses the picture that he does not know the food excitant, and is very often unaware that a food is responsible. The cutaneous tests should be done, but are usually of little value in this delayed type. A clue may frequently be obtained, however, by a searching clinical history, by determining for instance if there are any abnormalities in the diet; what foods, if any, are eaten to excess, or what foods are eaten though disliked. Elimination, or "trial and error" diets, are often used to advantage here. A man of 42, suffering for ten years from bad breath, coated tongue, nausea, eructations and constipation, had been examined, X-rayed, and had had an appendectomy. His symptoms disappeared and his weight increased upon total abstinence from eggs. A young woman with similar symptoms, in order to economize, made her lunch continually a glass of milk. All symptoms disappeared upon avoidance of milk. In neither case were skin tests of any assistance, being entirely negative. Often in both the immediate and delayed types of gastro-intestinal allergy, cutaneous symptoms are present and are caused by the same food allergens, by ingestion.

Cutaneous Group

Less well-known is the fact that in many instances a food, not by ingestion, but by contact alone with the unbroken skin, causes skin symptoms. An example of

this is the cook who develops a rash soon after handling a raw vegetable, such as white potato. Any variety of food may act in this way. Known especially as excitants of this type are egg, beef, fish, berries, pineapple, apple, carrots, celery, string beans and asparagus. The symptoms are usually mild, and evanescent, with itching and redness of the face, neck and hands, congestion of the eyes, and sometimes coryza and sneezing. The interval between cause and effect here is usually so brief that the disturbing food is well-known to the patient. The symptoms rarely become chronic or severe.

Not only foods but air-borne excitants, best known as causes of respiratory allergy, by contact, occasionally produce a dermatitis or eczema. Such cases are usually chronic and so masked that they would be difficult to recognize were it not for the respiratory allergy, asthma, hay fever, with which they are usually associated. Frequently the skin tests are of value. In some excitants of this air-borne type, the exciting principle is an oil, as in the case of ragweed dermatitis, which is seasonal. Contact or patch tests with the oil, obtained, from ragweed pollen gives a positive reaction in these cases.

Dyes, drugs and chemicals, by contact produce allergic dermatoses. Paraphenylenediamine, an ingredient of many dyes, inks, and stains, is especially irritating. In a young woman of twenty-eight years, a dermatitis of the eyelids of over a year's duration was found by patch test to be due to black dye and sodium bichromate, both present in her leather shoes, purse and gloves. Avoidance of black leather contacts cleared the condition. Dyes for furs, shoes, and fabrics must be borne in mind as possible causes of dermatoses, ranging from a mild acute itching and erythema to a chronic stubborn involvement. Lacquers, wood stains, dry cleaning fluids, and petroleum products also must be considered here. The clinical history and the anatomical distribution of the lesions often aid in determining the cause in these cases. Patch tests with a small quantity of the suspected material should be made, but with caution. Hair tonics and lotions, wave-set preparations of flax seed or quince seed, and other cosmetics, often containing bichloride of mercury, quinine or other chemicals, are known to have been contact irritants in many cases.

Drugs, by ingestion, are of course frequently responsible for acute and chronic rashes. Acetylsalicylic acid, phenacetin, the salicylates, quinine, antipyrine, pyrimidon, mercury, arsenic, and the essential oils must be considered as causes. The specific allergic reaction produced in hypersensitive individuals by these drugs must not be confused with the effect of ordinary overdosage, from which it is quite different.

There are a variety of other unusual allergic reactions which do not fall into the three groups just discussed, such as the occasional cases, proven to be allergies, of acute urinary bladder distress, epileptiform seizures, allergic arthritis, allergic labyrinthitis (with resemblances to Ménière's disease). The majority of such hypersensitive problems doubtless go unsuspected, indeed without a definite history, or the presence of known allergy, past or present, in the patient or his family, the

probability of proper etiologic classification is very slight. Rendering the situation more complex is the fact that the cutaneous test is of little aid in the majority of cases. With such a paucity of concrete evidence, it is little wonder that the border lines of clinical allergy become hazy and befogged, and that continually the temptation exists to make the diagnoses in these obscure conditions upon mere surmise.

In conclusion, it should be emphasized that these puzzling allergic forms of hay fever, bronchial asthma, urticaria and food disturbances differ from the more obvious chiefly in the difficulties they offer in identification, rather than in the problems connected with treatment. Certainly once their allergic nature has been recognized, it becomes apparent that the therapeutic methods applied to the typical cases, are equally applicable to these obscure allergic forms.

Vitamins and Infections of the Eye, Nose, Throat and Sinuses

G. M. Koepcke, M.D.

Minneapolis, Minnesota

VITAMIN therapy and a general knowledge of it has been advancing rapidly in the past few years. Heretofore, this therapy due to its newness, its derivation from food products, its wide scope and ease of applicability, has been dominated by the irregulars, most of whom were not careful clinical observers. This served to bring the entire therapy into a state of disrepute with the conscientious and conservative medical practitioner. To clarify conditions, laboratory investigators undertook to weigh its real value in closely guarded, highly technical, biological tests. However, their reports were of such nature that it was usually perplexing or impracticable to make any clinical application of the data they published.

That phase is now finished. Contributions are regularly being published by investigators versed in sound clinical medicine as well as experimental physiology. The development of the visual photometer test for vitamin A deficiency, the urine analysis and capillary fragility test for vitamin C, and to a more limited degree the heart-rate test for vitamin B, enable us to proceed with a much better perspective. Bacterial examination and other clinical observations carried out at the beginning and during the treatment, provide a double check on the progress of the patient. The result is a confirmation of many of the early ideas advanced as to its therapeutic merit.

In the past, the use of the combined or multiple vitamin concentrate preparations has been questioned sometimes as being unscientific and hence unjustifiable, but the findings reported by the investigating experimentalists and clinicians indicate that almost every deficiency syndrome is likely to present symptoms of a multiple vitamin deficiency nature by the time the physician first gets to see the patient. Next, once deficiency syndromes become apparent, the individual seems either unable to utilize the minute quantities of these vital food substances in their regular dietary, or consume greater quantities because of the disease and temporary vitamin imbalance, thereby setting up a vicious circle that only the administration of a sufficient quantity of all the

vitamins, fortified by specific vitamins where necessary, can alter. And, finally, due to lack of knowledge of the complex molecular structure of vitamins, the natural products or those concentrated from the natural source without too great a loss or alteration of the vitamins, are found to be superior to the chemically synthesized pro-vitamin or minutely fractionated concentrate. Thus, it may be seen that the extreme opposition to the part vitamins play in physiological chemistry is gradually giving way to a more rational outlook and better understanding. Furthermore, we may confidently look forward to a sound development and wide use of this therapy.

Vitamin deficiencies are now generally becoming recognized as a causative factor in the infections of the respiratory tract. Deficiencies of certain or all of the vitamins must be considered in the infections of the nose, throat and sinuses. However, it must be understood that vitamins are not a cure-all for diseases, but must be looked upon as a useful and necessary adjunct in the treatment and the prevention of disease. Bircher-Benner¹ states that neither prophylaxis nor therapeutics can be completely effective unless sufficient quantity of the vitamins are available to the human economy.

Of all the vitamins, A and C seem to be especially concerned with the lowered body resistance, thus permitting the infective processes to take place. Mendel², discussing vitamin A, states that bacterial invasion occurs in test animals when the A factor is eliminated from the food, and can be readily cured if the disease processes have not advanced too far, by the administration of the vitamins. The outstanding change in vitamin A deficiency is substitution of stratified keratinizing epithelium for normal epithelium in various parts of the respiratory tract. Mackie³ in his work on deficiency states, has confirmed the fact that infections of the eyes, tonsils, sinuses, buccal and lingual mucosa and the skin are conditions of avitaminosis A in the human subject. Park⁴, also Jeghers⁵, in recent papers call attention to the use of the visual photometer according to the technique of Jeans and Zentmire, as a simple method

for the detection of vitamin A deficiency and for measuring response to vitamin A therapy. Vitamin A evidently acts as a barrier against infection, by stimulating healthy epithelial tissue. It has a definite connection with the normal regeneration of visual purple and the prevention or cure of night blindness.

Deficiency of vitamin A reduces the resistance to infecting organism with resulting infection of sinuses, tonsils and ears. Glands of internal secretion seem dependent on the amount of vitamin ingested in food.

Sajous⁶ has shown that the opsonin of bacteriology is a secretion of the thyro-parathyroid glands and the spleen. The pancreas produces Ehrlich's complement while the amboceptor of Ehrlich is secreted by the adrenals. Ehrlich's amboceptor and vitamin C were thought by Sajous to be identical. Vitamins A, B, C and D are considered necessary for the thyro-adrena-pituitary group. Szent-Györgi⁷ states that vitamins B and C are necessary for the proper functioning of the adrenals. Takahashi⁸ noted a pronounced lowering of resistance to bacterial infection in his animal experiments in B and C deficiencies.

Tislowitz⁹ cites the successful treatment of diphtheria circulatory weakness with adrenal-cortical extract and vitamin C, and suggests that extracts of adrenal cortex together with vitamin C may prove helpful in the treatment of circulatory disturbances that develop on an infective or toxic basis.

While vitamins A and C tend to be pointed out as very important, vitamin B₁, D, G and possibly E and F should also be considered. When the first clinical symptoms of disease present themselves, it is important to start the vitamin medication at once. Multiple vitamin therapy often is indicated, not with the idea of instituting a hit or miss treatment, but for the purpose of establishing a prophylactic immunity toward any contributory infections while at the same time therapeutic immunization is enhanced toward the particular organism predominating in the infection. It is imperative that treatment should be started early, before the infection has become extensive, to obtain the best results. The rarity of contra-indications and the ease of instituting the multiple vitamin therapy, makes this treatment highly desirable.

Vitamin therapy is of great value in acute conditions which are slow in healing and tend to become chronic. It should be routine treatment in all chronic conditions which show a tendency to be latent. It is useful both in pre-operative and post-operative cases.

A few of the manifold conditions in eye, nose and throat in which vitamins are useful, are as follows:

Corneal Ulcers

Corneal ulcers, especially of the nutritional type, respond very readily to vitamin therapy. The patient complains of pain, scratching and soreness of the eye. On examination, small punctuate areas of ulcerations are found usually near the limbus. After a few days the areas have a tendency to coalesce, and further corneal destruction progresses very rapidly.

With a balanced combination of vitamins, reinforced by additional amounts of vitamins A and B, the process of healing is readily stimulated. The ulcer process stops and begins to heal. Vitamins are imperative in this type of ulceration.

Congenital Cataract

Congenital cataract responds favorably to vitamin administration. A case now under observation, has been treated solely with vitamin concentrates. Owing to the fact that the patient was a great distance from the Cities, a rude, yet standard testing equipment was arranged in the home. The test type could be seen at a distance of 10 feet and reading at 6 inches in January, 1936. Today, the distant vision is 18 feet and the reading vision distance is 21 inches. The lens opacity could be visualized easily in January, 1936. Today, the opacity can hardly be made out except by the use of reflected light.

The changes in photophobia, and general physical condition are so utterly changed that one would hardly recognize the patient as the same individual.

The vitamins, fortified particularly with A and C have a definite place in the treatment of this type of cataract.

Acute Inflammations

A noticeable observation in the treatment of acute inflammation with vitamin medication is that the convalescent period is shortened. The "all in" feeling so often mentioned by the patient following severe acute inflammation disappears.

Herpes Zoster Ophthalmia

Vitamin therapy in our hands, as an adjunct in the treatment of herpes zoster, has given very good results, and we feel that vitamin B₁ has a very definite place in the therapy for herpes zoster.

Sensitivity to Light

Patients examined for glasses complaining of sensitivity to light, and especially those having difficulty in driving at night, may have a hypo-vitaminosis A. Vitamin A given over a period of several weeks usually relieves the symptoms. Our experience over a period of eight months using the visual photometer to measure light sensitivity, visual purple regeneration, or night blindness, has shown us that within a reasonable percentage of error, we can estimate the need for the vitamin from our clinical observation alone. A careful recording of the symptoms and examination often reveals this in a much shorter time than the twenty-five minutes necessary to check each patient on the photometer.*

Sphenopalatine Neurosis

The severe pain and extreme discomfort can be quickly benefited by the addition of B₁ therapy.

*Frober-Faybor Biophotometer, loaned us through the courtesy of the Vitamin Products Company, Milwaukee, Wisc.

Acute Nasal Infections

Acute sinusitis responds nicely to vitamin A plus combined concentrates. It must be understood again, that vitamins do not replace any treatment for acute sinusitis, but enhances the routine in hand. The period to establish immunity to the predominating organism in the infection is materially shortened, thereby allowing quicker surgical interference with less danger of extension of the infection in adjacent structures. The healing period is surprisingly short. Vitamin A and multiple concentrate must be given in large doses. So far, no patient has experienced or shown any toxic effect or a hyper-vitaminosis in an acute infection. We feel that vitamin substance is the food for the endocrine glands. During an acute infection, the endocrine system, especially the suprarenal gland, is under tremendous strain. The patient is easily fatigued, feels tired and is slow in tissue healing. Vitamin therapy during the acute period and post infectious period gives the endocrine system the needed food for balanced function.

This may be shown by the fact that when a patient does not respond to glandular therapy, a response can be produced by adding vitamin concentrate medication.

Careful examinations of the nose and throat are imperative to determine the presence of abnormalities or a possible pent up pus in the paranasal sinuses. Where deformities exist, drainage of pus accumulations and needed surgical corrections should be made. It is good practice to give the vitamins before operative measures are instituted to build up the general systemic resistance,

and in this way hasten the healing process, and possibly help avoid the post-operative extension or the infections.

Summary

(a) Vitamin deficiencies are generally becoming recognized as an important causative factor in the infections of the respiratory tract.

(b) When the first clinical symptoms of disease present themselves, it is important to start vitamin therapy at once.

(c) A noticeable observation in acute inflammations is that the convalescent period is shortened.

(d) Vitamin therapy hastens the healing period.

(e) So far, no patient has experienced or shown any toxic effects of vitamin therapy in acute inflammations.

(f) Vitamin therapy gives the endocrine system the needed food for balanced function.

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Book Notices

A GREAT SURGICAL WORK

Surgical Treatment, by JAMES PETER WARBASSE, M.D., and CALVIN MASON SMYTH, Jr., B.S., M.D.; 2nd edition, thoroughly revised and re-set, 3 volumes with separate index, bound in maroon cloth, stamped in black and gold, 2,617 pages, 2,486 illustrations on 2,237 figures, some in colors; Philadelphia: The W. B. Saunders Company; 1937. Price, \$35.00 for the set.

This imposing work first appeared in 1918; this is its 2nd edition. The publishers have wisely allowed it to be completely re-set and thoroughly revised, and the result is an invaluable mass of surgical literature from a plenitude of sources. Every section of the work has been altered; some have been entirely re-written. Steps forward have been made in internal medicine, in radiology and roentgenology, in physical methodology, in anesthesia, in cranial operative surgery, in fracture treatment, etc., since 1918, the year this set first appeared. Thus, it has been imperative to present modern approaches and discussions of these great advances, and WARBASSE and SMYTH have done it honestly and competently. New drawings have been made by Mr. WILLIAM BROWN MCNETT, and Mr. ALBERT COMROE. Some of the photographic illustrations were made by JAMES F. SCHELL, M.D.

Every general practitioner ought to have this great work; and many surgeons no doubt already have had the 1918 edition these many years. This WARBASSE-SMYTH set cannot be recommended too highly.

A VALUABLE EDITORIAL HANDBOOK

The Preparation of Scientific and Technical Papers, by SAM F. TRELEASE and EMMA SAREPTA YULE; 3rd edition, blue cloth, stamped in black, 116 pages plus bibliography and index; Baltimore, Maryland: The Williams & Wilkins Company; 1936. Price, \$1.50.

This is a model handbook for all who wish exactitude in the preparation of scientific papers. It should be valuable to physicians in the preparation of their papers, although the work does not approximate in every respect the style used by *The Journal of the American Medical Association*, usually considered final authority by most physicians.

This book is rather a compendium of styles used by several authorities or societies in the preparation of printed material. Alternative styles are freely given. On the whole, *THE JOURNAL-LANCET* recommends this little volume.

POCKET PATHOLOGY TEXT

Pathology, by EDWARD B. KRUMBHAAR, M.D., Ph.D.; 1st edition, red cloth, stamped in black, 185 pages plus bibliography and indices, 18 illustrations; New York: Paul B. Hoeber, Inc. (Harper Medical Books); 1937. Price, \$2.00.

This is the 19th in the series of primers addressed to "The Medical Muse," and edited by EDWARD B. KRUMBHAAR, M.D., Ph.D., professor of pathology in the University of Pennsylvania School of Medicine. It so happens that Professor KRUMBHAAR also wrote this one. The volume might be called a literary approach to pathology. It is very interesting, excellently printed and bound, and constitutes a most pleasant history of pathology from the earliest to modern times. It is well worth owning.

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THE CITADEL

The Citadel, as nearly as we can make out, unfairly attacks the medical profession, more particularly that of London. How anyone could speak of the author as a "distinguished physician," we cannot understand. He attained the honorable degree of doctor but practiced medicine only five brief years, during which time he popped in and out of several positions of little importance. It is unfortunate, of course, that any man after graduation should fall in with such associates as he must have done, but in a land of free choice where birds of a feather may flock together, he lays himself open to a very natural implication in this connection.

Whether he had some guilty knowledge or merely dreamed about the possibilities of making "easy money" by criminal depravity in a profession that had enjoyed the confidence of humanity in all times, we do not know. At any rate, he deserted the practice of medicine for fiction, and this, his latest work, has created a furore on both sides of the Atlantic.

A. E. H.

THE BRONCHOSCOPIST MAKES ANOTHER CONTRIBUTION

Since the advent of collapse therapy in the treatment of pulmonary tuberculosis, it has been observed that some patients with satisfactory collapse of the lung continue to cough and to have numerous tubercle bacilli in the sputum. It has also been observed that the occa-

sional person has cough and positive sputum when no phase of the examination, including X-ray films made in various diameters of the chest, reveals any evidence of pulmonary lesions. Some of these cases have been thought to be due to the ulceration of tracheo-bronchial lymph nodes into the air passages. However, within less than ten years the bronchoscopists have made contributions which adequately explain this previously obscure condition. Such physicians as Schonwald, Clerf, McConkey, Myerson, Tucker, Eloesser, Coryllos, and Barnwell, have made important observations on tuberculosis of the trachea and bronchi.

Examinations for involvement of these parts of the air passage are being conducted in a very extensive manner in several parts of the country, and enough cases have already been reported to lead one to believe that the condition is by no means rare. The finding of tuberculous tracheo-bronchitis, which usually has a background of pulmonary tuberculosis, definitely complicates not only the treatment but also the ultimate prognosis. Indeed, when severe ulcerative tuberculous lesions are found in the trachea and bronchi, the advantages to be gained by collapsing the diseased lung are slight, since following collapse the sputum will continue to contain tubercle bacilli, and the prognosis of the tracheo-bronchial condition remains bad.

Bronchoscopic examination may soon be considered important in every case of pulmonary tuberculosis, in order to detect slight involvement of the trachea or

bronchi, when treatment may be of some avail. Moreover, periodic examinations by means of the bronchoscope should be made on all patients who continue to have such symptoms as cough and sputum containing tubercle bacilli after the lung has been adequately collapsed. The skill and care with which the bronchoscopist now makes his examination has so reduced the discomfort and harm to the patient that pulmonary tuberculosis is no longer considered a contraindication.

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J. A. M.

OLD AGE ASSISTANCE—ITS MEDICAL DANGER

Already there is to be envisioned on the horizon of medical economics a many-headed monster. Viewed hastily, it is innocuous enough, but, on closer examination, it is potentially the beast which has throttled the art and science of medicine in some foreign lands. The ogre under consideration is Old Age Assistance.

Administration of this governmental pension is not uniform in all counties. In one county of Minnesota, when the eligible recipient desires an increase of pension, he is referred by his county commissioner to his family physician. The pensioner is told that the doctor will, if he is willing, take up the matter with the proper officials and thus secure the additional income. Thereupon, the doctor becomes the pensioner's benefactor or persecutor.

In another county, the pensioner is referred to the investigator of the Old Age Assistance Division by the commissioner. Then, after the case is adequately investigated, the family physician receives a blank requesting the diagnosis, prognosis and estimated monthly cost of drugs and medical care. In one instance, at least, the blank has a postscript stating that 40 per cent reduction of medical fees in such cases is expected.

In both of these administrative methods the advisability, to say nothing of the legality of transmitting the diagnosis and prognosis to lay social workers, is subject to question. Endless controversy and unpleasantness may result. Law suits for malpractice may develop. In Minnesota it is illegal to inform a third person of the diagnosis of syphilis or gonorrhea in any case. And, finally, is it not conceivable that the accumulation of such statistics by social service workers can or will be used to the disadvantage of the medical profession in years to come.

During the depression years the medical profession of Minnesota, even though its income as well as that of

others was markedly curtailed, accepted a fee schedule 40 per cent lower than current medical fees for care of the indigent under both S. E. R. A. and F. E. R. A. This, it might be pointed out, is far more magnanimous than the action of the dispensers of the other necessities of life—food, clothing and shelter. And now, when boom times are apparent and the depression exists only as history, the profession is being coerced to continue its precedent of 40 per cent reductions of medical fees for the care of a group which the government has voluntarily decided to safeguard.

Superficially considered, these are minor matters. Yet, are they not the very essence of the practices which have led to so many evils, or even the downfall of medicine in Europe? Is it not the practice of certifying disability in both Germany and England that has increased the practices of the insurance physicians in those countries? But, is it not indirectly the result of such effort toward either self-aggrandizement or possibly self-preservation that has increased the number of sick days per year per employee in Germany from 5½ to 28, and in England from 9 to 12½? And, are not such practices responsible equally for the failure of the system and the lowering of medical standards in these countries?

What is the answer? First should be considered the safeguarding of the ideals and principles of the American system of medicine. This in turn demands that absolute honesty and fairness be the keynote in the evaluation of any case coming under the jurisdiction of the Old Age Assistance Division. Beyond this, a unified attempt should be made to eliminate those features which tend ultimately to undermine American medicine.

J. E. S.

Societies

SCIENTIFIC PROGRAM OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of April 8, 1937.

Dr. Donald McCarthy, Presiding.

THE FOUR LEAD ELECTROCARDIOGRAM IN CHILDREN*

(Inaugural Thesis)

PAUL F. DWAN, M.D.†

(Abstract)

Recent years have brought increasing interest in the use of the electrocardiograph as a means of understanding the damage to the heart muscle wrought by disease. The conventional three lead electrocardiogram has been of great help but in many cases seemed to fail us. Wolferth and Wood in 1932 reintroduced and made popular a fourth or so-called chest lead. This modification of technique was thought to elicit damage in parts of the myocardium which were "silent" to the conventional leads.

The technique of the chest lead is discussed and tables showing the normal and abnormal findings in adults and children are presented. We studied seventy-two convalescent cases of rheumatic fever by means of the conventional electrocardiograms and the chest lead. Our findings were presented in tabular form. From our study we feel that use of the four

* Am. J. D. Ch.—In Press.

† From the Department of Pediatrics, University of Minnesota, and Convalescent Home for Rheumatic Children, Lymanhurst Health Center.

lead electrocardiogram is indicated in all cases of suspected myocardial damage.

Discussion

Dr. H. L. ULRICH: I do not see children;—we have been carrying on fourth leads in adults recently. I was at first averse to doing this because of the variety of fourth leads that had been established. Like all new methods, the variety was so marked that you got disgusted and thought it a matter of extra work. But they are coming around to a standard system of the fourth leads in adults. The right arm electrode on the chest with left leg electrode in its usual position has been adopted by the Deutch and by Wilson of Ann Arbor. Whatever method is used, it should be stated so that fourth leads could be interpreted by any reader of graphs. Even in the fourth leads we experience normal configurations in the presence of coronary disease. A case came in on April 2nd, the four leads were normal, yet on April 4th that man had died of a coronary closure. From the history he was closing at the time we took his tracing. I think the taking of the fourth lead should be encouraged. I would like to see more work on the method I mentioned above because it is much easier for the technician and sometimes for the patient.

Dr. JAY C. DAVIS: For the last two years I have been using the fourth lead. It has been a valuable addition to electrocardiography in my opinion. We are all looking for aid in diagnosing coronary occlusion in the posterior or diaphragmatic portion of the heart and we all hoped the fourth lead would give us valuable information. It has helped some but not as much as we might wish. My experience has been that the fourth lead more often helps in anterior closure than it does in posterior closure. Not infrequently evidence of a closure is discovered in the fourth lead 18 to 24 hours before it shows up in the conventional leads.

Dr. Levine, of Boston, in his book on heart disease, stated that an absent Q4 together with positive T4 is almost pathognomonic of coronary occlusion. However, since that time it has been recognized that other conditions may give an absent Q4, an example of which was the patient I saw in consultation with subacute bacterial endocarditis whose heart was very carefully examined microscopically after death and no evidence of involvement of the coronary arteries could be found. This particular patient, however, had fluid in both sides of the chest, a small amount on the right and over 600 cc. on the left. Fluid in the chest may be one of the factors which can influence Q4.

The use of the left leg for one electrode with the right arm electrode used as the exploring electrode on the chest is more convenient for the technician and is also much better in the case of a very ill patient because it is not necessary to disturb him as it is when applying the electrode to the back. Another thing to bear in mind about the exploring electrode is that, as a rule, the nearer to the apex it is the more valuable is your information. The difficulty is that often the technician does not know where the apex is located. It might be well to set a standard and have the technician always place the exploring electrode at a specified distance from the left border of the sternum in a specified interspace.

Dr. PAUL DWAN: As to using the left leg instead of the back, there is no objection at all to anybody's using this means of recording. If we had all of the reports that have been done on the multitudinous varieties of chest leads under one standard, we would then have something to go on. It makes no difference which one we use so long as we stick to one procedure and establish our standards.

GENERAL SARCOIDOSIS

JAY C. DAVIS, M.D.

MINNEAPOLIS

The pathology of sarcoid was first described by Caesar Boeck in 1899. The histology of a section from a skin lesion was described by him as follows: First, foci of the epithelioid connective tissue cells, second degeneration in the central cells evidenced by the appearance of granules, and third where the destroyed cells had been removed, a rarification of the new

growth had occurred leaving a net work of reticulum. Furthermore, occasionally large foci were divided by connective tissue septa and a few giant cells of a sarcomatous type were seen. Mitosis was scarcely anywhere to be detected.

Since Boeck's description of the disease in the skin, the same ailment has been found to involve many organs of the body with or without skin manifestations. Many papers have appeared describing the condition under a variety of names such as Boeck's disease, Besnier's disease, Besnier-Tennesson's disease, Besnier-Boeck's disease, benign lymphogranulomatosis, sarcoid, multiple benign sarcoid of the skin, osteitis tuberculosa multiplex cystica, miliary or disseminated lupoid, lupus pernio and recently Hutchinson-Boeck's sarcoid.

The disease may manifest itself in many ways. It has been reported to occur in the skin, lymphatic glands, bones, lungs, heart, liver, spleen, intestine, brain, pituitary, testis; also, as was found in the patient to be reported herein, an interesting morphological picture of the blood revealed evidence of involvement of the reticulo-endothelial system.

The etiology of sarcoid is still obscure. Some of the dermatologists claim the condition is due to tuberculosis even though the majority of cases have negative tuberculin tests and the inoculation of the sarcoid tissues into animals has usually given negative results. Those who believe tuberculosis to be a cause of the condition explain the negative tests on the assumption that the microscopic changes are a result of anergy to chemical products of the tubercle bacillus. Because similar microscopic findings are seen in lues and leprosy, some French writers speak of "Terrain Sarcoidique." In more recent years most authors have come to regard sarcoid as an unknown entity although some believe it may be due to an unknown virus. Williams and Nickerson studied four cases in which there were biopsies. These studies were made of the skin in one case, of the spleen, liver and mesenteric nodes in the second, of the intestine in the region of the ileocecal valve in the third, and in the fourth the biopsy was taken from a case of regional ileitis. All gave the microscopic picture of sarcoid. In these four cases a skin reaction following the intradermal injection of an antigen made from a sarcoid lesion of the skin was positive, whereas four normal persons gave no such reaction. These results suggest sarcoid to be a virus disease. Some believe that sarcoid disease may be related to leprosy, or that there may be various types such as a leprosy type, a tuberculosis type, and an undetermined type.

The following is a case report of a patient with sarcoid disease who did not present skin manifestations.

In the treatment of these cases there is no single remedy. Drugs have been used such as arsenic, cod liver oil, and colloidal gold, and other measures such as milk and varying doses of roentgen therapy and sunlight have been recommended. However, none of these are specific, and since so many cases seem to recover spontaneously it is doubtful if any drug therapy is actually of value.

The patient is a married woman, age 24 years, 66½ inches tall, weighing 125½ pounds. She was first examined March 13, 1936, at which time she stated that she had been in good health until four years ago when she developed urticaria which was present off and on for one year and was followed by leukoderma of the face and neck. Three years ago she noticed that she began to be upset by matters of little importance and cried frequently. This continued to the present time. During the last two years she has had frequent head colds.

At the present time her complaints are a burning sensation in the epigastrium for the past two weeks coming on immediately after eating and lasting one to one and a half hours. Meats, fried foods and boiled cabbage seem to cause the distress. Milk or soda give her relief from these symptoms. Eight weeks ago she developed a head cold which is still present, and with the onset of this infection she noticed a swelling over both parotid glands, which gradually increased for three weeks but has remained stationary for the last five weeks. She has not had fever as far as she knows and has not lost any weight. She had an eccentric pear-shaped right pupil which, her mother states, was present as a baby and which the patient

remembers distinctly being present eight years ago when she entered high school.

She had smallpox, measles and whooping cough in childhood. Two days ago biopsy of the left parotid gland was done by Dr. Lawrence Larson.

Family History: Her maternal grandmother died of cancer of the breast, at the age of 58. Her maternal grandfather died of an undiagnosed stomach ailment, at the age of 60. Her father was killed in an accident at the age of 37. Her mother is 52 years of age and is living and well. Three sisters are living and well. The patient has spent several days visiting two sisters-in-law who have pulmonary tuberculosis.

Physical Examination: She has a patch of eczema on the occipital region of the scalp. The right pupil is of an eccentric pear shape and is drawn nasally where it is bound down to the lens by an adhesion. There is a mass the size of a small walnut in the region of the isthmus of the thyroid. There is marked hard swelling in the region of both parotid glands. In the posterior portion of the left parotid there is an incision 1.0 cm. long resulting from a biopsy. It is healing by primary intention. Over the face and neck there are many irregular shaped areas of leukoderma 1 to 5.0 cm. in diameter. The remainder of the examination was negative except for a slight cervicitis. The blood pressure was 104/72, pulse 90, and temperature 97.8°.

Laboratory: The value for the hemoglobin was 88%, the red cells numbered 4,400,000, and the white cells 6,200 per cubic millimeter of blood. Examination of a smear of the blood stained by the Giemsa stain showed many monocytes, some with vacuolated cytoplasm. The smear was examined by Dr. Hal Downey whose report follows: "The most important feature of the blood is the presence of many monocytoïd reticulo-endothelial cells. Some of these have vacuolated cytoplasm and so appear quite histiocytic. The majority of them are intermediate between reticulo-endothelial cells and monocytes and do not show the histiocytic features." Urinalysis gave essentially negative results. The fasting blood sugar was 87 mgm. The fasting blood urea nitrogen was 13 mgm. An intradermal Mantoux test using 1-1000 and 1-500 dilution of tuberculin was negative. Intradermal skin tests for food sensitivity were negative. Likewise, pollen scratch tests gave negative results.

Urine examined for tubercle bacilli by smear as well as by intraperitoneal inoculation of a guinea pig gave negative results.

The Kolmer and Wassermann tests of the blood were negative. The Kline test of the blood was negative. Agglutination tests of the blood for typhoid, paratyphoid, and Malta fever were likewise negative.

The electrocardiographic findings showed a low potential of QRS, 2 mm. with notching. T3 = +0.3 mm. and P3 +0.4 mm. Q3 = 3 to 4 mm. and R4, 1 to 2 mm. In lead IV the exploring electrode was at the apex and the other electrode on the left leg.

X-ray studies were made by Dr. Russell Morse. Those of the gastro-intestinal tract including a barium enema, and those of the bones of the hands and feet, long bones, and pelvis were negative for any pathological changes with the exception of a small cyst-like area at the base of the medial portion of the spine of the right tibia. X-rays of the chest revealed marked swelling of the glands at the hilum of the lungs and these were apparently disseminated throughout both lungs with a slight increase apparent in the lower part. In the upper there was a very fine discreet mottling. Expression of the gastric contents was done and analysis of the contents gave negative findings. Sections made from the biopsy of the parotid gland showed the histology of sarcoid.

Progress: Her condition remained stationary until May, 1936, when the swelling of the parotid glands became somewhat less but about this time swelling of the submaxillary glands appeared. By the latter part of June the swelling of the parotid glands and the submaxillary glands was less marked and the blood picture showed no monocytoïd cells having reticulo-endothelial characteristics noted in earlier smears. The

course of the disease as followed by blood smears showed the monocytes becoming progressively more mature as the patient improved although numerous toxic p.m.n.'s persisted for a long time. The assumption is that the monocytoïd cells of the earliest smears were not reticulo-endothelial cells but immature monocytes showing some reticulo-endothelial characters and that they were derived from the reticulum which was active at that time.

Summary

Hutchinson-Besnier's disease, or generalized sarcoidosis, is frequently a generalized systemic disease that may involve the skin, bones, lymph glands, spleen, liver, lungs, heart, mucous membranes, conjunctiva, parotid, submaxillary and sub-lingual glands, intestines, testis, pituitary, brain. As Hunter states, Hutchinson was presumably the first to mention the condition, although Boeck was undoubtedly the first to describe the microscopic appearance of the lesion.

A case is reported with involvement of the parotid, submaxillary and sublingual glands, lungs and bones, as well as a long-standing iridocyclitis. In addition, a very interesting blood picture is reported showing numerous very early monocytes apparently derived from the reticulo-endothelial system. These monocytes varied with the course of the disease, being most numerous and showing the greatest immaturity at the height of the disease and becoming progressively more mature as the patient recovered. Also this type of monocyte indicates that at the height of the disease there was an increased activity of the reticulo-endothelial system.

This patient was seen last July 12, 1937, at which time she appeared to have completely recovered.

Discussion

DR. RUSSELL W. MORSE: Roentgenograms made of the chest of this patient showed a slight thickening of the hilus shadows and an unusual slight thickening of the interstitial tissues, particularly in the middle and lower parts of the lung. We were unable to classify this pathologic change and felt that it might be due to any one of several pathological conditions.

When Dr. Davis told us that tissue sections of the parotid were tuberculous, we were still unwilling to consider these pulmonary changes as a tuberculous lesion. The findings which we observed were similar to changes described as occurring in sarcoid disease.

DR. JAY DAVIS: This girl did not have skin lesions of sarcoid. The first diagnosis was parotitis; the second diagnosis was uveal parotitis, which I changed to generalized sarcoid after finding the pathology in the chest, the bone cyst, and the interesting morphological picture in the blood. She was treated first with X-ray by Dr. Morse, and later Dr. H. Michelson gave her colloidal gold.

LAWRENCE R. BOIES, M.D.,

Secretary.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE Meeting of May 12, 1937.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, May 12th, 1937. The meeting was called to order at 8:00 P. M. by the president, Dr. E. M. Jones. There were fifty-one members and one guest present.

The scientific program followed.

TUMORS OF THE JEJUNUM

DR. JAMES A. JOHNSON

MINNEAPOLIS

Abstract

Tumors of the jejunum, both malignant and benign, are comparatively rare. Carter states that malignant tumors of the jejunum comprise approximately one per cent of all of those occurring in the gastro-intestinal tract. Benign growths are likewise rare and consist chiefly of adenomas, myomas and angiomas. Textbooks on surgery contain very little, if anything at all, on this subject except to mention that they are very rare. In 1927 Hellstrom reported 73 cases of cancer of the

small bowel but did not mention their location. In 1936 Nettrour, Webber and C. W. Mayo found only 31 cases of carcinoma of the jejunum in the files of the Mayo Clinic. Geschickter, from the Surgical Pathologic Laboratory of Johns Hopkins, reported 39 cases of benign tumors of the small bowel with 16 cases of carcinoma, four of which were in the jejunum. In the University of Minnesota Pathologic Laboratory files were found only two cases of cancer of the jejunum in a total of 20,000 complete autopsies in adults. In reviewing case reports, it is evident that many of these growths occur very near the ligament of Treitz and become a difficult surgical problem. It is my purpose, therefore, to discuss in particular the surgical treatment and to report four operated cases with successful termination.

There are three types of carcinomata of the jejunum: (1) the constricting or stenosing type, (2) the flat ulcerating type, and (3) the polypoid type. Sarcoma may arise from the submucous, muscular or subserous coats and tends to assume an external growth, either solid, but more often cystic, with areas of degeneration. Benign tumors consist chiefly of adenomas, single or multiple, which are not infrequently responsible for intussusception. The symptoms are of an indefinite nature, often consisting of vague gastric distress with weakness, loss of weight and fatigue. If the growth progresses to stenosis, there is of course evidence of high intestinal obstruction. Diagnosis is difficult and depends upon the amount of obstruction present. Obstruction in this locality, if marked, may produce some dilatation of the proximal loop of the duodenum or jejunum and this dilatation may become an important X-ray finding. If there is a stenosing growth, it can be recognized as well here as in any other portion of the bowel. Very few cases, however, are diagnosed before operation.

If complete obstruction has been present for some time, it is important to prepare the patient before operation is undertaken. This can best be done by emptying the stomach with nasal suction and administering glucose and saline intravenously. If anemia is pronounced, a blood transfusion should be given. The operation consists of thorough removal of the growth, together with proper restoration of function by an end-to-end or side-to-side anastomosis. This is not especially difficult when the tumor is located far enough down so that a side-to-side anastomosis can be done. When it is located at or so near the ligament of Treitz that this becomes impossible, the restoration of the lumen often becomes a difficult problem, because the proximal loop is usually very dilated and so edematous that an end-to-end anastomosis cannot be done. R. Franklin Carter, in the *Annals of Surgery* for December, 1935, recommends a side-to-side anastomosis of the distal end of the jejunum to the third portion of the duodenum. This appeals to me as a splendid procedure but it may be difficult in some instances, particularly where the duodenum is not much dilated.

I wish to present here another method. Recently I encountered an annular carcinoma of the jejunum, located so near the ligament of Treitz that only a small stump of the proximal loop remained when the growth was adequately removed. The proximal loop was so dilated and hypertrophied that an end-to-end anastomosis could not be done. I decided to employ a large, round Murphy button. This was easily inserted and was reinforced by two layers of catgut in the serosa and muscularis, thus producing a tight, secure, end-to-end enclosure. The postoperative convalescence was uneventful. The patient has no symptoms and shows no evidence of obstruction by X-ray at present, and has regained his normal weight. I recommend this method in cases where the tumor is located so near the ligament of Treitz that a side-to-side anastomosis is impossible or when the proximal loop is so dilated and edematous that an end-to-end union becomes unsafe.

The immediate operative mortality in removing tumors from the jejunum is high. Hellstrom in 1927 reported a primary mortality in resected cases of 36.2 per cent. R. Franklin Carter in 1935 reviewed 30 cases, 24 of which had resections with a primary mortality of 43.4 per cent. The mortality was highest in those in which an end-to-end anastomosis was done.

Case 1. On February 27, 1935, I was called in consultation by Dr. H. W. Quist, to see Mrs. G. H., age 35, who had

been admitted to the hospital February 23rd with a severe attack of upper abdominal pain which was thought to be gallstones. She had had previous attacks. She continued to vomit, however, and a couple of days later she passed a bloody stool. On the same day a mass was felt in the left upper abdomen. A small amount of barium was given and showed a dilatation of the duodenum and jejunum. An obstruction in the jejunum was diagnosed and operation was advised. At operation, about four inches below the ligament of Treitz there was an intussusception of gangrenous bowel. A resection was done with side-to-side anastomosis. On opening the bowel a papillary growth with a necrotic polyp was located on the bowel wall. Pathological report showed that this was an adenomatous non-malignant growth. She was given a blood transfusion and had an uneventful recovery and has been well to date.

Case 2. Mr. G. F., age 63, gave a negative past history. His present trouble dates back about one and a half years, during which time he had had indefinite symptoms of indigestion with epigastric distress. He had lost 40 pounds in weight. He had previously had two X-ray studies of his stomach elsewhere and a diagnosis of duodenal ulcer had been made. Treatment had been given without any relief. He was admitted to the Eitel Hospital on September 13, 1936. X-rays of the gastrointestinal tract revealed considerable dilatation of the duodenum, which extended to about three inches beyond the ligament of Treitz, at which point an annular constricting growth was located and Dr. Ude made a diagnosis of carcinoma of the jejunum with partial obstruction. Operation on September 18, 1936, revealed a large, annular carcinoma of the jejunum three and one-half inches from the ligament of Treitz. The growth was almost completely obstructing the bowel. The proximal loop was much dilated and edematous. The mesenteric glands were involved. The growth was widely resected and an end-to-end anastomosis was made with a large round Murphy button. His convalescence was uneventful. He has regained his normal weight and has no symptoms. Pathologic report by Dr. O'Brien revealed adenocarcinoma of the jejunum with metastasis of the regional lymph nodes.

Case 3. Mrs. L. B., age 57, had been treated for secondary anemia for the past 18 months. She had had during the past year two attacks of abdominal distension with cramps lasting for two days. After the first attack in April, 1936, she felt a mass in the left lower abdomen. The last attack in September was severe. She consulted her family physician, Dr. Oliver Porter, who immediately sent her in for examination. There was a movable mass in the left abdomen which, when the patient was lying down, could be felt in the upper abdomen and when the patient was standing could be felt below the navel. A barium enema was given. There was no evidence of any tumor in the colon. Operation October 15, 1936, at which time a large partly cystic tumor was found in the jejunum about seven inches below the ligament of Treitz. There were metastases in the liver around the gallbladder. There were numerous glands in the mesentery involved. The growth was widely resected and a side-to-side anastomosis was done. Pathological report by Dr. O'Brien showed that the tumor was a sarcoma, presumably a neurosarcoma. Postoperative convalescence was uneventful. She has been in fair health and relieved of her previous symptoms.

Case 4. Mrs. L. B., age 36, admitted to Eitel Hospital on January 8, 1937. There was a history of attacks since June, 1936, which consisted of dull pain in the region of the navel with epigastric distress. Attacks had gradually increased in severity and lasted about three hours. At various times she vomited. Between attacks she had much epigastric distress and feared to eat, losing 20 pounds in weight. X-rays of the gallbladder showed impaired function with a single stone. Gastrointestinal X-ray showed a normal stomach and duodenum. There was also an irregular distribution of barium in the small bowel with some areas of dilatation and stasis. X-ray of the colon was normal. Operation January 22, 1937, revealed a thick-walled gallbladder, containing a solitary stone. Cholecystectomy was done. The entire bowel was then carefully examined. At a point about four feet from the ligament of Treitz there was

a movable mass in the bowel. The bowel was opened and an ulcerating adenoma was exposed, which looked malignant. The growth was resected and a side-to-side anastomosis was done. Pathologic report by Dr. O'Brien showed no evidence of malignant changes but revealed a large polyp with ulceration. Convalescence was uneventful. She has been relieved of all her previous symptoms and regained her normal weight.

Summary

1. Tumors of the jejunum probably comprise about one per cent of all those occurring in the gastro-intestinal tract.

2. When an unexplained high obstruction is evident and no cause can be found in the pylorus or duodenum, it should be remembered that tumors may be present in the jejunum.

3. A simple, safe method of end-to-end anastomosis is here recommended in cases that are located so near the ligament of Treitz that the usual operative procedures are either too dangerous or impossible.

Discussion

Dr. A. R. COLVIN, St. Paul: I just want to emphasize one point made by Dr. Johnson and which he has emphasized, *i. e.*, in case of gastro-intestinal hemorrhage, if, at operation, the cause which has been suspected is not evident, to make a thorough search for causes which maybe have not been suspected.

I recently saw a patient who had an inoperable carcinoma of the jejunum. He had had several transfusions and finally a gastro-enterostomy, under the belief, evidently, that the hemorrhage was due to peptic ulcer. The autopsy revealed a carcinoma which had become spontaneously anastomosed with another coil and was clearly inoperable. The story of bleeding had extended over several years.

Dr. ARNOLD SCHWYZER, St. Paul: I want to congratulate Dr. Johnson for this group of interesting cases. These cases are rare and that he should have had four of them in a short time is quite an experience. I have seen only one and detected that one by accident. In the course of a gallstone operation we noticed a thickening which was rather circular in the lower duodenum or upper ileum. I resected and the patient recovered from the operation but gradually lost ground and later died from carcinoma.

This presentation was very good and the microscopic slides excellent. I am glad the Murphy button has come into its own again. I have used the Murphy button every now and then right along and feel just as Dr. Johnson does, that where there is difficulty in suturing, the Murphy button will get you out of some tight places. However, when there is a large upper gut end and a smaller lower one, there is great danger of the Murphy button staying there for a long time. For such a case I have a Murphy button on which the two halves are a little different in size. The half with the smaller diameter is put in the upper gut and the larger one into the lower gut. If I do not feel quite safe as to the union on account of tension, I make an invagination stretching the lower narrower part of gut over the button for half an inch or one inch above and secure it there with a couple of continuous or interrupted sutures. Then I know the button must go down. I think that is a worth-while point.

Dr. JOHN NOBLE, St. Paul: I am rather hesitant to discuss the question of malignancy of the small intestine because of my meager first-hand experience. I feel that statistics on the matter of frequency have perhaps been distorted and I am perfectly in agreement with Dr. Johnson as far as these figures are concerned. Yet, in my experience, I have seen only three cases of malignancy of the small intestine. The first case was a gelatinous carcinoma of the duodenum; the second case was a liomyoma-sarcoma of the jejunum and the third case was mentioned by Dr. Colvin. I think the discrepancy in statistics may be due to the fact that the case reports of malignancy of the small intestine are more likely to be published than are reports of carcinoma of the stomach, for instance. In the first case mentioned, the patient's condition warranted no surgical interference. The second case presented a picture of low-grade chronic partial intestinal obstruction. Efforts were

made to localize the point of obstruction but these were unsuccessful and the patient died before any surgical exploration could be done. This tumor proved to be a liomyoma-sarcoma situated in the jejunum. I know this type of tumor is usually benign and that it is the most common tumor found in the stomach. It also occurs in the small intestine, however, and in this instance the lesion was malignant. Here there was definite evidence of local invasion but no distant metastases were found. The third case was the one Dr. Colvin mentioned. The picture was that of a high intestinal obstruction and the patient had had previous gastric surgery. The tumor at autopsy was found to be adenocarcinoma of the jejunum, in which, due to adhesions and infiltration of the several loops of the small intestine, anastomoses had occurred. The lesion was grossly mistaken for an inflammatory mass and not until microscopic sections were studied was it discovered that the lesion was adenocarcinoma. In none of the three cases was clinical diagnosis made. These are the only three cases I have seen first-hand. Recently I have been impressed with the newer methods in the X-ray diagnosis of tumors of the small intestine and I feel that as this technic is developed we will be able to diagnose these lesions more frequently and that our accuracy will be somewhat comparable to the diagnosis of the lesions in the stomach and colon.

Dr. R. G. ALLISON, Minneapolis: X-ray diagnosis of tumors of the small intestine can readily be made, with even a mild degree of obstruction, by a barium meal. In cases which present themselves with symptoms of obstruction, a flat film of the abdomen should always be made as a preliminary measure. If dilated loops of small bowel are found, barium should not be administered. If, however, no dilated loops are found, it is perfectly safe to administer a barium and water mixture.

Dr. JOHNSON, in closing: I want to thank the gentlemen for their interesting discussions. I would like to see the button Dr. Schwyzer has been using. I have used the Murphy button for many years and have never seen one that failed to pass. If such cases have been reported, it is quite probable that the button has been defective or inserted wrong; the male portion of the button should always be inserted in the proximal loop. During the four years I was with Dr. Murphy, I never saw him use anything but a button for gastro-enterostomy except in a case of a small child. They all passed without any difficulty. The button usually comes loose in about ten days and then passes so silently that the stool has to be watched carefully to recover it. The button used in this case was so large that it became lodged in the rectal pouch. I have never before had to remove one.

Tumors of the jejunum of course are a rare condition, but I want to leave with you two thoughts concerning them. First, if a case is being operated for a lesion in the pylorus or duodenum, especially of an obstructing type, and none is found, it would be well to remember that it might be in the jejunum and, accordingly, do not forget to explore it. Second, if one is confronted with a difficult anastomosis in the small bowel, such as occurs at or very near the ligament of Treitz, it is well to remember that a Murphy button can often be used to advantage.

ADAMANTINOMA WITH CYST OF LOWER JAW

Dr. A. R. COLVIN
ST. PAUL

An enumeration of the various names given to adamantinoma is an indication of the direction in which a knowledge of these tumors has developed, *i. e.*:

1. Epithelioma adamantinoma.
2. Central epithelioma.
3. Cystoma.
4. Multilocular cystoma.
5. Proliferating cysts of the jaw.
6. Embryo-plastic adamantoma.
7. Central paradental cyst.
8. Central cystadenoma.
9. Central papilloma of the jaw.
10. Adamantine adenoma.

At the present time they are designated "Solid Adamantinoma" and "Cystic Adamantinoma." In the early stages of their development they may be confused with root cysts or follicular cysts; in other words, they may present as small cysts.

These cysts have frequently been operated on under the belief that they were root cysts. This was my experience in the case I am reporting, except that I operated on a cyst twice before recognizing the real nature of the trouble. Because of the, at times uncertain, nature of the behavior of these tumors, I am reporting a case demonstrating the long-drawn-out history and apparently benign course. They are almost always found in the lower jaw and have their origin from the germ cells of the enamel epithelium or from the epithelial remnants of this structure. They grow slowly and distend the jaw more than they destroy it. They may involve the entire half of the jaw, and, while usually possessing all the characteristics of a benign tumor, they must often be treated as malignant because of the continuous growth of tumor cells remaining after incomplete removal. Heath reported a case recurring after 35 years, and one case has been reported as recurring after 45 years. They may appear at any time of life. Perthes says they never metastasize. Ludek reports a case with undoubted metastases in the lung. Adamantinoma may vary greatly in size, at times growing as large as a child's head.

Histologically, there is seen a large amount of connective tissue stroma in which are found epithelial cords and islands resembling the structures found in the germ cells of the enamel of the tooth follicle. This arrangement is found in the walls of the cysts as well as in the solid tumors.

Differential diagnosis is uncertain not only in the early stages of root cysts and follicular cysts, but also in later stages. The central fibroma presents difficulties not only clinically but also radiographically. The X-ray is important not only for diagnosis but to establish as accurate a plan of operative procedure as possible, so that, because of the great tendency to recurrence, it can be determined whether it may not be possible to operate radically and still leave a sufficient ridge of the lower border to maintain the form and support of the jaw. Recurrences may, however, be a long time delayed (45 years) and so it may be advisable to remove all suspicious tissue before resorting to exarticulation, and observe the case frequently for recurrences, hoping that they may be long delayed.

I wish to report the following case of adamantinoma:

The patient, a female age 42, was first seen in 1921 with a history of a painless lump in her lower jaw. Believing this to be either a root or follicular cyst, it was operated by removing the outer wall and curetting out the lining membrane. For a recurrence in 1923 the same procedure was carried out. In 1926, at operation for another recurrence in which the cyst was clinically about the size of an almond nut, on removing the outer wall there were now found several smaller cysts. These were opened in such a manner that an open cavity was made. This healed over, but recurrence took place about one year later (January 12, 1928). At this time an incision was made in the submaxillary region and the cyst exposed extra-orally. The outer wall was removed, revealing a multilocular cyst. Cavities extending from the lower end of the ascending ramus forward to the lateral incisor were found, and these cyst walls were removed with burr and curette.

In November, 1929, another recurrence was evident and again the bone was approached in the same manner; the lateral incisor, canine and bicusps were removed, and, with rongeur forceps and burr, the bone was removed leaving only a ridge of the lower margin of the jaw about half an inch thick.

It is now seven years since this was done and there is no evidence of recurrence at this time.

Osteitis fibrosa, and bone granuloma or osteodystrophia fibrosa beginning in the central part of the jaw, of doubtful origin, and consisting of at first loose and later much firmer fibrous tissue, presents difficulties in diagnosis also; and histological examination must in all of these conditions furnish the deciding evidence in the differentiation from adamantinoma and, indeed, from all tumors of the jaw. In this connection, to illustrate

the difficulties of diagnosis and the necessity for making use of every form of information to be gained from clinical, radiographic, histological and the findings of gross pathology as exposed as operation, I would like to refer to the following case:

The patient, a female age 18, first noticed a swelling of the gums above the upper jaw two years ago. This increased gradually for over a year. Two months ago she was hit over the left side of the face by a horse suddenly jerking its head in her direction. She says the swelling increased more rapidly since then. She had not at any time suffered any pain. There was marked fullness of the cheek on the left side; just above the lateral incisor was a firm elastic mass about the size of a walnut. There was a fullness of the left side of the hard palate.

At operation an incision was made over the prominent mass. After reflecting the mucous membrane, the mass was exposed and found to have destroyed the outer wall of the antrum. The tissue comprising the mass was of a very tough fibrous consistency and filled the entire antrum, so that, in removing it, it was found that the walls of the antrum in various places were destroyed; and on attempting to remove all of the tissue comprising the mass, one felt that this tissue became part of the wall very much like the insertion of the larger tendons. It soon became apparent that if the tissue was malignant (which it did not seem to be), and, having perforated the walls of the antrum in various places so that its complete removal was impossible, radical resection of the upper jaw would still fail to remove all diseased tissue; and if it were not malignant further damage to the adjacent structures (the contents of the orbit, for instance) was inadvisable. Recovery from the operative attack was uneventful and she was given X-ray treatment. When seen a few weeks ago there were no clinical evidences of recurrence. A radiograph still shows a dense shadow in the antral region.

Pathological Report by Dr. John Noble: The specimen consists of a large mass of small, irregular fragments of tissue of varying size all of which have about the same gross appearance and structure. There appears to be an outer, quite friable, papillary surface and central portion which is quite fibrous and tough in consistency. It cuts with increased resistance. All of the tissues present the same gross appearance.

Microscopic: Sections of the tumor of the antrum and maxilla show it to be composed of masses of dense hyaline connective tissue showing large amounts of collagen fibril. The bulk of the tumor is composed of this tissue but there are some small areas of connective tissue which are somewhat more cellular. Throughout the stroma small spicules of bone and osteoid tissue are scattered at irregular intervals. There is no evidence of epithelial tissue and no evidence of malignancy is seen. From the gross picture and from previous experience with similar lesions in other bones, a very guarded prognosis should be given, however. The histologic picture is that of an osteitis fibrosa of the solid type.

Diagnosis: Osteitis fibrosa.

The conditions described above conform more nearly to the condition defined as "bone granuloma" and, while isolated cases have been reported, it is still unsettled as to whether it is of inflammatory or neoplastic nature. Perthes comments on the fact that it has not previously been described in systematic treatises of the jaw and that in the former edition of his own work it was not referred to; but now, in his newest work, he is evidently endeavoring to arrange some of these conditions under the heading of "Granuloma" or "Osteodystrophia Fibrosa." With all of these facts in mind, one would scarcely have been justified in doing more than was done in this case.

Discussion

Dr. JOHN NOBLE, St. Paul: These two cases reported by Dr. Colvin have been interesting to me, particularly the second one. In the first case I studied only the sections and, as shown on the lantern slides, the tumor was adamantinoma. These tumors arise from the peridental epithelium and they take on various forms. The tumor can present a picture similar to the one shown forming numerous cysts, or it can be a

solid adenocarcinoma. Squamous cell tumors are also seen and one form is indistinguishable from a sarcoma, being composed of spindle cells. These tumors are characteristically slow growing and the difficulty from the standpoint of surgical treatment is the matter of complete removal. They frequently recur but seldom metastasize. Distant metastases have, however, been reported in lung and cervical lymph nodes. The second case I saw clinically with Dr. Colvin. She was a young girl and the tumor from an X-ray standpoint was malignant. As far as could be determined, the tumor arose from the antrum or the maxilla. It invaded the walls of the antrum and the orbit. We came to the conclusion, after microscopic study of the tumor, that it was an osteitis fibrosa of the solid type. In long bones we know that this lesion occurs in two forms—the cystic and the solid type. This lesion resembled more closely the solid type but had none of the giant cells so frequently seen. We know that osteitis fibrosa may take one of three courses. It has been known to subside without any therapy. It can be eradicated by curetting the cysts. The lesion is closely related to giant cell tumors of the bone and malignant changes have been reported following this type of lesion. The thing that interested me particularly in this case was the matter of the fundamental etiology of the disease. Did it represent a true neoplasm or was the lesion simply a proliferative inflammation? We know that chronic inflammatory processes in the antrum are extremely frequent. This type of reaction to inflammation must be very rare. The fact that bone destruction occurred need not be evidence against the inflammatory nature of the lesion. We know that certain proliferative inflammatory processes of the bone can be destructive. It will be interesting to follow the eventual outcome in this instance.

Dr. R. G. ALLISON, Minneapolis: The case Dr. Colvin exhibits, with involvement of the antrum, gives the characteristic X-ray appearance of a malignant lesion. I think it extremely rare to see chronic involvement of the antrum progress either to destruction of bone or to a wide-spread osteomyelitis. These tumors are much more common in the lower jaw.

Dr. KENNETH BULKLEY, Minneapolis: In connection with this case of Dr. Colvin's, I would like to report a case of adamantinoma of the lower jaw which went on eventually to death. The man was a first cousin of Dr. Janeway and a brother-in-law of mine. Shortly after graduation from medical school he developed a mass in the lower jaw. He was operated three times, each time with recurrence, and perhaps two or three years between each recurrence. Finally he went to Baltimore and saw Dr. Bloodgood who did a resection of the lower jaw. The laboratory diagnosis was made in this case by Dr. Ewing. This man lived to be about 54. He eventually developed local extension into the nasopharynx and a trifacial neuralgia for the relief of which Dr. Harvey Cushing operated on the gasserian ganglion. The process finally extended through the base of the skull with secondary infection and meningitis. This was a typical case of adamantinoma which continued over a period of 25 years after the first local incision in the lower jaw.

The meeting adjourned.

A. G. SCHULZE, M.D.,
Secretary.

News Items

Dr. Warren Fetterly, Minneapolis surgeon, has associated with the Malmstrom-Sarff Clinic in the First National Bank Building in Virginia, Minnesota.

Dr. Peter Douglas Ward, superintendent of Miller Hospital in St. Paul, Minnesota, has been named a member of the board of directors of the American Hospital Association.

Dr. Ray Kenneth Proeschel, of Kimball, Minnesota, has located at Willmar, Minnesota.

Dr. William E. Morse, Rapid City, South Dakota, spoke on "Syphilis" before the Rapid City Lions Club on August 31, 1937.

Dr. J. Emery Frank, Springfield, Minnesota, has sold his practice to Dr. Engward Lewis Penk, of Stewart, and will move to Marshall, Minnesota.

Dr. Nils Orville Agneberg, a graduate of the Northwestern University Medical School, is a member of the staff of the North Dakota State School at Grafton.

Dr. Hubert Waldemar Lee, formerly of Northfield, Minnesota, has located with Dr. Nesmith Perry Nelson, Brainerd, Minnesota.

Dr. Joseph Ewing Cowperthwaite, 65, of Butte, Montana, died September 15, 1937. He was graduated from the Chicago Homeopathic Medical College in 1896.

Dr. Amos R. Gilsdorf, a graduate of the University of Minnesota Medical School, is now an associate fellow of the Dickinson Clinic, Dickinson, North Dakota.

Dr. Zachariah Eugene House, for 30 years in the U. S. Indian Service, and at present serving the Cass Lake (Minnesota) district, will retire.

Dr. Roscoe C. Hunt, of Fairmont, Minnesota, will build a two-story air-conditioned hospital with capacity of fifteen beds on the site of Fairmont's old hospital.

Dr. Edwin John French will be on the staff of the Ronan Hospital in Ronan, Montana. The hospital is now managed by Mrs. Margaret Ross, R.N.

Dr. William J. Mayo, of Rochester, Minnesota, has been named a trustee of the Mount Rushmore National Memorial Society, according to press dispatches.

A \$7,864 addition to Hospital Building No. 12 at the Veterans' Facility at Hot Springs, South Dakota, will be erected as soon as bids have been accepted.

The Minnesota State Board of Health will have a new \$225,000 brick and tile building on the University of Minnesota campus, according to news dispatches.

Dr. Elmer W. Wahlberg, Isle, Minnesota, has moved to Morgan, Minnesota, to assume partnership with Dr. William E. Johnson, of that town.

Dr. Otmar Thurlimann, 37, of Harvey, Illinois (Chicago), died in Duluth, Minnesota, on September 14, 1937.

Dr. Arthur Neumaier, a graduate of Duke University School of Medicine (Durham, North Carolina) in 1935, has joined the staff of Raiters Hospital in Cloquet, Minnesota.

Dr. Joseph Anthony Muggly, Norway, Iowa, a graduate of the Creighton University School of Medicine in 1934, has associated with Dr. Daniel S. Baughman, at Madison, South Dakota.

Major William S. Bentley, M.D., formerly resident physician of the old Asbury Hospital in Minneapolis when it was used as a veterans' hospital, died in Sioux Falls, South Dakota, during August. He was graduated from the Hahnemann Medical College & Hospital, Chicago, in 1893.

Dr. Gilbert Seashore, coroner of Hennepin County, Minnesota, was named a member of the board of directors of the National Association of Coroners at the recent meeting in Cleveland, Ohio.

Dr. Robert Bray, a graduate of the University of Minnesota Medical School, came from Fargo, North Dakota, on September 2, to begin as a staff member of Biwabik Hospital, Biwabik, Minnesota.

Dr. Donald Leo Gillespie, a graduate of the University of Minnesota Medical School in 1934, has joined the pediatrics staff of Murray Hospital in Butte, Montana.

More than 1,100 cases were treated at the University of South Dakota Students' Health Service during the 1936-1937 school year, reports Dr. Hugo C. André, director.

Dr. Ralph Phillip Jones, 46, a graduate of the Hahnemann Medical College & Hospital of Chicago in 1915, died at Veterans' Facility, St. Cloud, Minnesota, on August 22, 1937. He was buried at Azalea, Michigan.

Dr. Peter T. Spurck, chief of the X-ray department of St. James's Hospital in Butte, Montana, was a visitor to the Fifth International Congress of Radiology held recently in Chicago.

The \$40,000 hospital scheduled to be erected in Wolf Point, Montana, will not be built until 1938, because of crop failure. It was to have been operated by the Trinity Hospital Association, Inc.

Dr. Herman H. Jensen, of Atwater, Minnesota, has moved his family to Minneapolis, where he will do post-graduate work at the University of Minnesota. He will retain his Atwater practice, however.

Dr. Charles Nutzman, a graduate of the University of Nebraska College of Medicine, will be a member of the Health Service of the University of Montana for the coming school year, according to dispatches.

Dr. Andrew John Heimark, 57, of Fargo, North Dakota, died in a Fargo hospital on September 17, 1937. He was graduated from the University of Illinois College of Medicine in 1904.

Dr. Milton Charles Rosekrans, Neillsville, Wisconsin, a graduate of the University of Minnesota Medical School in 1929, has located in Wahpeton, No. Dak., to assume the practice of the late Dr. Benjamin Thane.

Dr. John Edward Mannion, formerly of Platte and Wagner, South Dakota, and a graduate of Creighton University School of Medicine in 1920, has located at Gregory, South Dakota.

The Silver Bow County Hospital in Montana is buying a new portable X-ray unit and other X-ray equipment, according to Mr. Emmert P. O'Brien, chairman of the board of commissioners of Silver Bow County.

Dr. Wilbert W. Yaeger, Ivanhoe, Minnesota, a graduate of the University of Minnesota Medical School in 1927, has moved to Marshall, where he succeeds Dr. Lawrence John Happe.

Dr. Cecil A. Wilmot, a graduate of the University of Minnesota Medical School, has joined his brother, Dr. Harold Eugene Wilmot, Litchfield, Minnesota, in the practice of medicine.

A Federal grant of \$25,364 has been received by Dr. George Sheldon Adams, superintendent of the Yankton State Hospital of South Dakota, for the construction of a new watering system.

Dr. Agnes Dunnigan Gray Stucke, Garrison, North Dakota, has been named a member of the Public Health Advisory Council of the state for a 6-year term, by Governor William Langer.

Dr. Warren Wilson, Sr., of Northfield, Minnesota, died on September 4 at his home. He was graduated from Northwestern University School of Medicine in 1889.

Dr. Moses Barron, professor of medicine in the University of Minnesota Medical School, spoke before the Blue Earth County Medical Society on September 13, 1937.

Dr. Myron O. Henry, Minneapolis, spoke on "The Surgical Treatment of Fractures of the Hip" and "Spinal Fusion: The Chip Graft Method," before the British Columbia Medical Association at Vancouver on September 14 and 15, 1937.

Dr. Frank L. Bryant, instructor in otolaryngology in the University of Minnesota Medical School, spoke on "The Fever Therapy Treatment of Acute Sinusitis" at the annual meeting of the American Congress of Physical Therapy in Cincinnati, Ohio.

Dr. William George Durnin, a graduate of the University of Colorado School of Medicine in 1932, and formerly of the department of orthopedics in Los Angeles County Hospital, California, has located in Bottineau, North Dakota.

Dr. James Moorhead Murdoch, for 10 years superintendent of the Minnesota School & Colony for the Feeble-minded at Faribault, was presented with a gold watch by the Minnesota State Board of Control and other medical superintendents recently. He has retired.

Dr. Robert Warren Diver, a graduate of the University of Kansas School of Medicine in 1924, left Clay Center, Kansas, recently to establish ophthalmological and otorhinolaryngologic practice in Livingston, Montana.

Dr. Edmund S. Donohue, formerly of the Marine Hospital in Baltimore, Maryland, and a graduate of the Creighton University School of Medicine in 1933, has purchased the practice of the late Dr. A. L. Jones, Gregory, South Dakota.

The Grand Forks District Medical Society met at Grafton, North Dakota, on September 15. Dr. Oliver Sayles Waugh, associate professor of clinical surgery on the University of Manitoba Faculty of Medicine at Winnipeg, spoke on "Head Injuries." About 25 physicians attended.

Dr. Peter Potter, of Butte, Montana, was honored by a banquet in his honor given by the Silver Bow County Medical Society on September 23, 1937, on the occasion of his retirement. Dr. Potter came to Butte on October 1, 1907. He has been president of the Murray Hospital in Butte for many years; and has been president of the Butte Chamber of Commerce since 1929. He retires on November 1.

Dr. John Earl Schroepel, New Ulm, Minnesota, has purchased the practice of Dr. W. B. Kaufman, of Winthrop, and will practice there. Dr. Kaufman will go to the Baltimore Eye & Ear Hospital for training before re-locating at New Ulm.

Dr. Thomas B. Magath, Rochester, Minnesota, professor of parasitology in the University of Minnesota Graduate School of Medicine, has been elected president of the American Society of Clinical Pathology. He is city health officer of Rochester.

Dr. Gaylord W. Anderson, chief of the department of preventive medicine and public health at the University of Minnesota, assumed his duties on September 8, 1937. He succeeded Dr. Kenneth Maxcy, who went to Johns Hopkins University.

Dr. Carl Sandstrom, chief of the radiological department of Saint Eric's Hospital in Stockholm, Sweden, visited the Quain-Ramstad Clinic in Bismarck, North Dakota, on September 24, 1937. He also made a tour of the North Dakota bad lands.

On September 27, 1937, the Woman's Club of Crystal Bay, Lake Minnetonka (Minnesota), unveiled a plaque in the Orono Town Hall at the lake in honor of Dr. William Newhall, who practiced medicine at Crystal Bay for 33 years. Dr. Newhall died nine years ago.

Students in the University of South Dakota School of Medicine at Vermillion ranked highest in scholarship of any group in the university during 1936-1937, according to Mr. H. W. Frankenfeld, registrar. The general average was 85.12.

Dr. Roger L. J. Kennedy, assistant professor of pediatrics in the University of Minnesota Graduate School of Medicine, Rochester, was elected president of the Northwestern Pediatric Society at Duluth, Minnesota. He was formerly secretary-treasurer of the group.

Dr. Milo Raymond Snodgrass, Miles City, Montana, described his observations and study at the University of Michigan Hospital while he was there last summer, before the Miles City Kiwanis Club on August 30, 1937. Dr. Snodgrass was graduated from the University of Michigan in 1928.

Bids will be accepted on October 12 for construction of the new \$130,000 hospital to be built by Lewis & Clark County in Montana, according to Mr. Thomas J. Cooney, chairman of the county commissioners. The PWA has allotted \$60,144.00 toward this project. It will be T-shaped, three stories.

Dr. William Francis Cashmore, Jr., who was graduated from Rush Medical College of the University of Chicago in 1933, and took his internship at St. Luke's Hospital in Chicago, became a member of the staff of the Thompson-Klein Clinic in Helena, Montana, on September 1.

Dr. Walter J. Marcle, for 10 years chief of the tuberculosis service of the Veterans' Administration Facility at Fort Snelling, Minnesota, was guest of honor at a dinner held for him at the Curtis Hotel in Minneapolis on September 28, 1937. He was a founder of the National Tuberculosis Association, and a president of the Minnesota Public Health Association.

Dr. Marcus Claude Terry, a graduate of the Keokuk Medical College in Iowa in 1897, has been transferred from Palo Alto, California, to the Veterans Administration Facility at Saint Cloud, Minnesota.

Dr. Frances Ralston Vanzant, of Houston, Texas, who was an instructor in medicine in the University of Minnesota Medical School in 1934, and assistant director of the University Hospital, has gone to Spain as a physician sent there by the Medical Bureau to Aid Spanish Democracy.

Although South Dakota has no respirator for the treatment of poliomyelitis, the 40 et 8 group of the American Legion proposes to purchase one, according to Harry Darling, D.D.S., of Aberdeen, grand chef de gare of the organization. It will cost about \$2,000.00, and will be kept at either Huron or Mitchell.

Dr. Herbert H. James, chief of the surgical department of Murray Hospital in Butte, Montana, has been made a member of the American Radium Society. One of his articles, "Treatment of Uterine Hemorrhage of Benign Origin With Radium," was published in the January 1936 issue of THE JOURNAL-LANCET.

More than one year ago, Dr. Marion Mercer Hursh, of Grand Rapids, Minnesota, published an advertisement saying that he was writing off a large number of accounts. During September a man from Arkansas who had owed him a bill for 24 years walked in to pay it. The man had read Dr. Hursh's advertisement.

Dr. Harry Eagle, Baltimore, Maryland, whose new book, *The Laboratory Diagnosis of Syphilis*, was reviewed in the September issue of THE JOURNAL-LANCET, spoke before the Interurban Academy of Medicine in Duluth, Minnesota, on September 15. Dr. L. F. Hawkenson, Brainerd, was another speaker.

Dr. Milo M. Loucks, a graduate of the University of Minnesota Medical School in 1930, who spent some time at Fort Crook, Nebraska, as assistant district surgeon for the Army as a reserve officer, has entered practice with Dr. Alfred G. Chadbourn, at Heron Lake, Minnesota.

Dr. Frank H. Krusen, associate professor of physical medicine in the University of Minnesota Graduate School of Medicine, Rochester, was elected president of the American Congress of Physical Therapy at Cincinnati, Ohio, on September 24; and Dr. M. E. Knapp, Minneapolis, was elected a vice-president.

Dr. E. A. Meyerding, St. Paul, Minnesota, secretary of the Minnesota State Medical Association, and for thirteen years executive secretary of the Minnesota Public Health Association, was elected president of the Mississippi Valley Conference on Tuberculosis at a meeting in Dayton, Ohio, on September 25, 1937.

Dr. Wallace Lynnville Matlock, formerly of Huron and Rapid City, South Dakota, has established offices at 653 Main Street in Deadwood. Dr. Matlock was graduated from the medical department of the National University of Arts & Sciences, St. Louis, in 1918. He served in the World War as an army physician, and returned to the army in 1933. He returned to private practice on September 1, 1937.

Woodrow Nelson, B.S., M.D., who was graduated from the University of Minnesota Medical School, has completed a two-year internship at the Gallinger Municipal Hospital in Washington, D. C., and will associate himself with Dr. John Leo Devine, of Minot, North Dakota.

Dr. Edward J. Engberg, of St. Paul, Minnesota, who specializes in neurology and psychiatry, and who is a member of the Minnesota State Board of Health, has been appointed superintendent of the School for Feeble-Minded at Faribault, Minnesota, by the State Board of Control.

Dr. Irwin Henry Schmidt, 46, of Faulkton, South Dakota, died at his home and was buried on September 5 in the Faulkton cemetery. He was graduated from the St. Louis University School of Medicine in St. Louis in 1916, and was health officer for Faulk County.

Dr. George Goble Sale, a graduate of the Cornell University School of Medicine, New York City, in 1935, and recently of the George F. Geisinger Memorial Hospital in Danville, Pennsylvania, has been appointed assistant to Dr. Meredith B. Hesdorfer, chief of the students' health service of the Montana State University at Missoula.

A new hospital whose cost is estimated at from \$5,000 to \$7,500 will be constructed at Shelby, Montana, by remodeling the old East Side grade school in that city. The new hospital will be 44 feet by 58 feet, and will contain four private wards, three 3-bed wards, a kitchen, surgery, nursery, reception room, dark room, X-ray room, etc. It will be owned by Toole County.

Brigadier-General Frank T. Hines, chief of the Veterans' Bureau in Washington, D. C., reports that 6 cancer clinics will be established to treat 400,000 American veterans expected to develop the disease. They will be at Hines, Illinois; Washington, D. C.; Portland, Oregon; Los Angeles, California; New York City (Bronx); and Atlanta, Georgia.

Dr. Carl John Potthoff, Sherburn, Minnesota, has accepted the post of assistant professor of biological studies in General College of the University of Minnesota. Dr. Potthoff was graduated from Johns Hopkins University School of Medicine, and went to Sherburn to take over the practice of Dr. Walter Bret Wells, who had gone to Jackson.

The first west coast meeting of the American Academy of Orthopedic Surgeons will be held January 16 to 20, 1938, at the Hotel Biltmore, Los Angeles. Special trains will be run with stop-overs at Santa Fe, the Grand Canyon, San Francisco, and other points. Physicians may write to Mr. Robert L. Lewin at the Hotel Biltmore in Los Angeles for further details.

The Wabasha County Medical Society of Minnesota will hold its 69th annual meeting at Kellogg, Minnesota, on October 7, under the presidency of Dr. B. A. Flesche, Lake City. Drs. E. G. Bannick and J. F. Weir, Rochester, will speak. Others are: Dr. R. H. Frost, Wabasha; and Dr. George E. Hudson, assistant professor of obstetrics and gynecology in the University of Minnesota.

A three-months' report was submitted to the Butte (Montana) Anti-Tuberculosis Society on September 21 by Dr. Joseph Lorin Mondloch. Dr. Alfred Karsted is vice-president of the society's board.

Dr. Byrl R. Kirklin, of the Mayo Clinic, Rochester, was elected president of the American Roentgen Ray Society in Chicago on September 16; and Dr. Charles Sutherland, also of Rochester, was elected librarian of the Radiological Society of North America.

Dr. Magnus Bjornson Halldorson, of Winnipeg, Manitoba, Canada, a graduate of the University of Manitoba Faculty of Medicine in 1898, has taken over the practice of Dr. George Richard Waldren, of Pembina, North Dakota. Dr. Halldorson is a member of the North Dakota State Medical Association.

Dr. Arthur David Haverstock, 53, who was born in Minneapolis and was graduated from the Minneapolis College of Physicians & Surgeons in 1909, died in Monrovia, California, on September 9, 1937. He had practiced at Seward, Alaska, and in 1935 was president of the Alaska Territorial Medical Association.

Dr. Byrl R. Kirklin, professor of radiology in the University of Minnesota Graduate School of Medicine at Rochester, and Dr. Harry M. Weber, instructor in radiology, won the first award for their exhibit at the International Congress of Radiologists at Chicago on September 17, 1937.

Dr. G. Alfred Dodds, superintendent of the North Dakota State Tuberculosis Sanatorium at San Haven, announces that beds are now available at the sanatorium for both male and female tuberculosis patients. Any North Dakota physician may now secure immediate sanatorium care for his patients. Application forms may be secured by writing to Dr. Dodds at the sanatorium.

Dr. Howard William Karl Zellhoefer, a graduate of the Harvard Medical School in 1931, former fellow at the Mayo Clinic, and ship surgeon on the Grace Line's *Santa Paula*, has established practice (surgery) at Sioux Falls, South Dakota, in the Medical & Surgical Building.

The customary Saturday morning broadcasts (9:45 A. M., WCCO, 810 kilocycles, 370.2 meters) of the Minnesota State Medical Association, with Dr. William A. O'Brien, professor of pathology and preventive medicine in the University of Minnesota, as speaker, will present these subjects: October 2, "Heart Disease"; October 9, "Hand Infections"; October 16, "Dietary Dangers"; October 23, "Hemorrhage"; October 30, "Dental Health Education."

The Eastern Montana Medical Association and the Northeastern Montana Medical Association met jointly at Sidney, Montana, on September 23. Dr. J. H. Garberson, of Miles City, spoke on "The Diagnosis and Treatment of Head Injuries"; and there was a motion picture film lent by Dr. Jesse G. M. Bullowa, clinical professor of medicine in the New York University College of Medicine, New York City. A committee was appointed to investigate the formation of a women's medical auxiliary. The next meeting of the Eastern Montana Medical Association will be held in January 1938 at Terry, Montana.

Dr. and Mrs. Roy F. Raiter, Cloquet, Minnesota, sailed on the steamship *Aquitania* on August 18 for Europe, where Dr. Raiter will spend two months at various surgical clinics.

Health officers of every political district of Minnesota met at the University of Minnesota on September 24 for the annual Minnesota Sanitary Conference. Dr. Royd R. Sayers and Dr. George W. McCoy, of the United States Public Health Service, Washington, D. C., were among the speakers. Dr. John A. Ferrell, associate director of the international health division of the Rockefeller Foundation, New York City, was also a speaker.

Applications for the post of associate medical officer for the U. S. Government (various branches) at \$3,200 a year must be filed with the United States Civil Service Commission at Washington, D. C., by October 18, 1937; or in the case of physicians living in Montana, by October 21, 1937. Applicants must be citizens, have a Class A medical diploma granted not more than 7 years prior to May 1, 1937, must have had one year of internship, must not be 35 when application is tendered, and must be in good health.

Dr. Frank J. Heck, chairman of the Committee on Medical Education & Research of the Mayo Clinic, Rochester, Minnesota, announces that a special program of lectures and demonstrations in surgery and medicine will be held at the Mayo Clinic from November 8 to 12, inclusive. Mornings will be devoted to surgical and medical clinics. Afternoons and evenings will be given to clinics, pathological conferences, symposia, etc., on gastroenterology, sulfanilamide therapy, hematology, neurology, allergy, diseases of the chest, and cardio-vascular diseases. Visiting physicians are urged to attend.

On August 30, 1937, Dr. J. Arthur Myers, Minneapolis, professor of medicine in the University of Minnesota Medical School, spoke before the Idaho Tuberculosis Association at Boise; on September 15, before the 96th anniversary meeting of the Wisconsin State Medical Society at Milwaukee; on September 22, before the joint meeting of the Medical Society of the County of Queens and the Queensboro Tuberculosis and Health Association at Brooklyn, New York; and on September 25, before the health education session of the Mississippi Valley Conference on Tuberculosis at Dayton, Ohio. On September 30, Dr. Myers addressed the Southern Tuberculosis Conference and the Southern Sanatorium Association at Richmond, Virginia.

Dr. John Francis Norman, of the Crookston Clinic, Crookston, Minnesota, was elected president of the Northern Minnesota Medical Association at the close of the 17th annual session at Hibbing, Minnesota, on August 27 and 28, 1937. Dr. Owen W. Parker, Ely, was elected vice-president; and Dr. Clarence Jacobson, Chisholm, was chosen secretary-treasurer. Professor J. A. Merrill, formerly president of the Superior State Teachers College, spoke on "The Wonderland of Lake Superior"; and Dr. R. G. Leland, of the Bureau of Economics, American Medical Association, Chicago, spoke on "The Business Side of Medicine." Dr. A. W.

Adson, president of the Minnesota State Medical Association, and professor of neurosurgery in the University of Minnesota Graduate School of Medicine, also spoke. Dr. Oscar O. Larsen, Detroit Lakes, the retiring president, asked physicians to participate in the national crusade against venereal diseases.

The Center for Continuation Study of the University of Minnesota announces the program of medical seminars for 1937-1938. The faculty will be selected from the medical school, graduate school, Mayo Foundation, and general extension division, and will also include distinguished teachers from other medical centers. Lectures will be given in the classrooms of the Center, and clinics and demonstrations in the medical school, University of Minnesota Hospitals, and affiliated institutions.

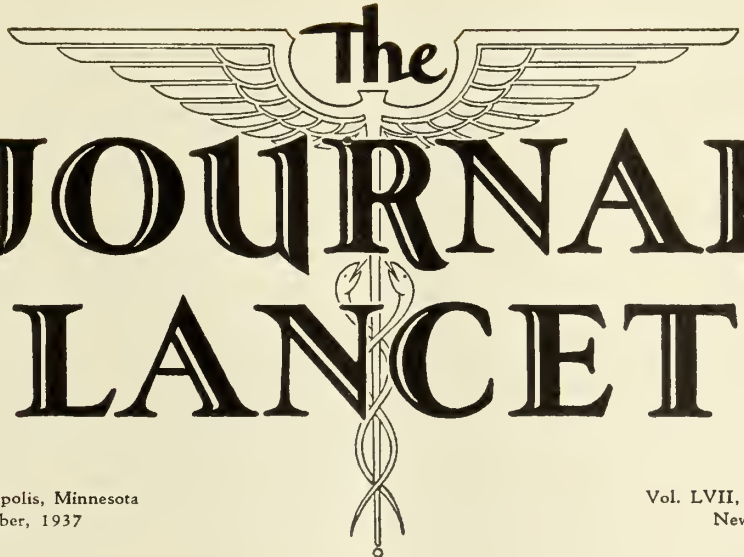
Each seminar will occupy the full time of the graduates from Monday to Saturday, inclusive. There will be no evening classes. Special library facilities for each seminar will be provided at the center. If the interest warrants, lecture, clinic and demonstration mimeographed outlines will be sold for a nominal fee after each week's program. A special feature will be round table conferences at the close of the daily program to give the graduates an opportunity to ask questions.

Any licensed physician who is a member of his local or state medical association or of the American Medical Association may register for the seminars. Physicians residing outside the state are accepted on the same basis as Minnesota physicians. All physicians should register as far in advance as possible. This will give the chairmen of the seminar committees an opportunity to plan for the special needs of those who will attend. This planning has been an important factor in the success of the programs presented previously.

Subjects will include: from November 1 to 6, "Surgical Diagnosis and Treatment"; December 6 to 11, "Dermatology & Syphilology"; January 16 to 21, "Ophthalmology & Otolaryngology"; February 7 to 12, "Medical Diagnosis & Treatment"; March 7 to 12, "Traumatic Surgery"; April 4 to 9, "Endocrinology"; and dates not yet announced, "Diagnostic Radiology," "Clinical Pathology," and "Proctology." Address all inquiries to: Director, Center for Continuation Study, or to Dr. William A. O'Brien (same address), University of Minnesota, Minneapolis.

Four new teachers have been added to the staff of the University of South Dakota Medical School at Vermillion, according to J. C. Ohlmacher, M.D., dean. They are: Russell William Heady Gillespie, Ph.D., of Yale University; John T. Manter, Ph.D., Columbia University; Henry Morrow Sweeney, B.S., M.S., Ph.D., formerly instructor in physiology in Tulane University, New Orleans; and Harold Douglas McEwen, B.A., M.A., Ph.D., formerly instructor in biochemistry in the University of Rochester, Rochester, New York. Einar Leifson, Ph.D., formerly instructor in bacteriology in Johns Hopkins University, replaces Professor Charles Hunter (bacteriology); and William H. Waller, Ph.D., replaces Professor C. M. Macfall (anatomy).

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New Series

The Sanatorium Care of Tuberculosis* *In South Dakota*

J. Vincent Sherwood, M.D.
Sanator, South Dakota

IN SAYING a few words about the sanatorium care of tuberculous patients in South Dakota, I will not advance any theories, or make any recommendations about how tuberculosis should be cared for. This is obvious for two reasons: (1) You could learn that from someone perhaps far more able to teach it than myself; (2) Although tuberculosis care is a vital subject, still much attention has been called to the general care of tuberculosis, and it need not be repeated at this time.

A brief history of the sanatorium is as follows: In 1909 the legislature of South Dakota passed an act establishing the South Dakota State Sanatorium for Tuberculosis, and directed the Board of Charities and Corrections to select a site. The present site was selected, and a few years later a building was erected. In the fall of 1911, the place was opened with six patients as residents. A few years later the present structure was built, enabling the institution to care for something less than 200 patients. The reason for the selection of this site, I do not know. The story is that a certain doctor in the Black Hills who was active in the legislature was approached by those interested, and, asked about a site in the Black Hills, he made the remark that it would be fine so long as a site was chosen as far from him as possible—it was.

The original statutes for this institution called for treatment of incipient cases, and we have no legal

right to admit any other cases to this sanatorium. The charter also called for keeping these patients until cured. The thought back of this, of course, was evident. If only incipient cases were admitted, the incidence of apparently cured would be quite high, and our dismissal rate would be steady and fairly rapid. As a matter of fact, in going over our records for the past 20 years, I find that out of 3,451 admissions, only 427 were classified here as incipient. These were mostly dismissed within a few months as arrested cases; but the others stayed on for an indefinite length of time. This has crowded the sanatorium with chronic incurables or probable incurables, and has decreased the actual benefit to the state that this institution should have produced. Of course, we could not discharge these cases, once entered, for they were never cured. We could very nicely take care of 30 or 40 incipient cases, keep them, arrest their infection, and return them as useful citizens to the state if we had vacant one bed now being occupied by an old patient who has been here for 14 years or more. We have now overcome this, as I will mention later.

We classify as incipient, a case with slight infiltration in one or both apices, or a small part of one lobe, with or without positive sputum but with no constitutional symptoms or very slight, slight or no elevation of temperature and pulse rate, and no gastro-intestinal, throat or other complications. This is essentially the definition given by the National Tuberculosis Association.

Moderately-advanced cases are those with no marked impairment of functions, either local or constitutional,

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localized consolidation moderate in extent with little or no evidence of cavity formation, or infiltration more extensive than incipient, and no serious complications.

Far-advanced cases are those with marked impairment of functions, local and constitutional, marked consolidation of either lobe, or disseminated areas of beginning cavity formation and serious complications.

As long as far-advanced cases are sent out here, I suppose that long will they be admitted to the sanatorium. It is true these cases should be segregated, but the question is should they be here, thus keeping a curable case from obtaining benefit?

Our routine for entrance provides that when you, as physicians, have a case that you think should have specialized care, you must examine him, have the county judge question him, and issue an order for his admittance. The judge then sends us a copy of the order, which we keep on file. Then, when there is room, we send a notice to the patient to come, and give the judge a copy of this letter. This, then, makes the entry legal. We cannot admit anyone without this procedure. We have found that patients do much better if no relatives are around. The average person does not realize that time is essential in treatment. Any relative keeps the patient constantly wrought up about his condition, besides constantly stopping us to answer questions. Even eight-year-olds get along better alone.

After a patient is entered, he is put to bed on strict rest for a period of a month or more, during which time he is observed and classified for continued rest or he is allowed some privileges. By privileges, I mean that he is allowed to go to the bath room once or twice a day, and this is increased gradually to four times a day, or full bathroom privileges. We observe the patient's pulse and temperature, as well as his chest lesion, and use these criteria as guides in allowing more privileges. Each individual reacts differently to exercise, both physically and mentally, and we allow considerable flexibility in this arrangement.

When a patient is able to be up and about for some time, we let him take his meals at the dining room and go for short walks. Some do a small amount of work in the occupational therapy shop, or carry on a craft in their own room. Specimens of these patients' work are seen in the lobby of the building.

As far as special treatment directed toward the chest tuberculosis is concerned, pneumothorax and phrenic nerve sections are done here, and further surgical collapse is done by surgeons throughout the state. It has always been the policy here to be rather conservative in collapse. We have had a tendency to watch the tuberculosis, and not to do pneumothorax if the disease is not spreading. Some others disagree with this policy, and we are changing our idea on that, also. Some go so far as to say that if thoracoplasty is needed, it is because of neglect or if pneumothorax was started in time, it would have made further surgery unnecessary. We will not go into that, as this paper is to outline our care here at Sanator. We feel, however, that where pneumothorax has been instituted, and good collapse is not

obtained, and the disease extends or does not improve, we should send these cases to a surgeon who does thoracoplasty, and have his opinion as to whether or not he feels surgery would benefit the patient. In 1936, we had about 60 patients to whom we gave pneumothorax and a few more than 20 each, on whom phrenic and thoracoplasty operations were performed. The distribution over the state you can see by the map before you.

Some cases of glandular, intestinal and bone tuberculosis, we feel are helped by ultra-violet irradiation. Except for the above and throat infections, we do not use irradiation. Irradiation of the throat and direct application of the sun on the vocal cords, we feel in some cases, does hasten healing. These throat cases give themselves sun applications direct to the larynx by means of metallic mirrors. Patients can do this by themselves with less gagging than with help. When the infection causes much pain, it may be necessary to alleviate it with an anestheticizing spray and by actual cautery. We will add equipment for the latter as soon as we can.

We are about ready to open an additional ward just back of the auditorium, which we hope eventually to make into a surgical ward. Then, we can keep our thoracoplasties here. We will, of course, still have surgeons come in to do this work. A tuberculous patient is best watched at a sanatorium. We hope also to add the necessary instruments with which to do this work and also the work of freeing adhesions, which keep some of the pneumothoraxies from becoming effective. For the time being, we will use the above-mentioned ward for an admittance ward; and concentrate the advanced patients there, also. A few cases come in for observation, and it is advisable to keep them away from contact with active open cases. We can do that in this new ward. The sick patients, of course, will be in their own rooms, and the observation cases will be in their beds for a period, although they may have use of the parlor.

It is not the far-advanced cases which should be advised to receive sanatorium treatment, for they are the cases least benefited. We do at times have moribund patients sent out here. An emaciated, far-advanced case usually does become physically improved at the sanatorium, that is true; but that is because he remains in bed. He usually is not cured of his tuberculosis, however, and more frequently than not his tuberculosis improves very little. After destruction of the lung begins, there are usually such massive adhesions to the chest wall that collapse of the lung by pneumothorax is impossible, and the patient is a poor risk for surgery. The only hope for control of tuberculosis is, of course, by early diagnosis and early collapse where improvement is not satisfactory. It is, therefore, the early case, in which there is hope of cure, that should be sent to the sanatorium—legally the only case admitted to Sanator.

I am pleased to see, more and more, earlier cases being admitted here. Recently, we have had questionable cases sent out here for observation and it should be so. These can be observed better where one can follow their

condition, and after a few weeks, can put their minds at ease.

The control of tuberculosis will become more of a public health problem if the chronic cases are not admitted to the sanatorium. Of course, there should be a place for segregation of these chronic cases. Either an enlargement of the present institution in the form of a new wing, or establishment throughout the state of farms or colonies for this purpose would serve the purpose best. Many of the older patients are able to take care of themselves and others, too. If two or three colonies were established throughout the state, these unfortunate cases could be segregated nearer home, where they would be more content, but still be separated from the public, where heretofore they have been wont to stray. It has always been my thought that public health laws have been a little too lenient with this disease.

Perhaps the past few remarks might be considered outside the subject announced; but I do hope that some day we will have other institutions in the state for the care of chronic cases.

You know that this sanatorium has a laboratory in which the usual routine tests are made and an X-ray and light room from which some commendable work is turned out. Not only chest work but as occasion demands, bone and gastro-intestinal X-rays are taken. In other words, we attempt to treat the patient as well as the disease.

We, of course, have our own dairy which supplies us with an abundance of excellent milk. Weekly counts show that we keep the bacterial content of the milk from 50 per cent to 75 per cent below the permissible count for certified milk.

We buy and serve only first-grade food to the patients, and we maintain an excellent cooking staff and dietitian. Special diets are frequently called for.

We have a motion picture show for those who may be up; and have weekly church services in charge of various ministers from the Hills region. Occasionally other diversions help keep the patients content.

Legal Problems

I mentioned previously of being able now to cope with the prolonged residence of chronic cases in the institution. At the last legislature, a bill was introduced and passed which called for a probation period of six months for new entrants to the sanatorium, and also called for a maximum residence time of 18 months. Occasionally, we receive patients who we feel, after due observation, do not have active tuberculosis and should not be here. Any time before six months, then, these patients may be dismissed from observation. Likewise, some cases received are far-advanced and receive no special benefit from residence here; and these may be dismissed. Then again, some patients refuse to submit to sanatorium routine and demoralize the other patients. If patients pass through the probationary period, and after 18 months seem to be unimproved, they may be legally dismissed. However, if we feel further care will be beneficial, any patient may be kept longer upon our

recommendation. We do not mean ruthlessly to discharge every patient after 18 months, but we do want the authority to do so when we deem it advisable. I believe that with the aid of this law, this sanatorium can be made more useful to the state, and be kept from being an old folks' home.

While I am speaking of laws, I would like to mention House Bill 126. This law provides that the counties shall place a lien against any property a recipient of county aid might have, or against the property of those responsible for the recipient's support. The purpose of the law is evident. However, instead of specifically mentioning the patients at the State Sanatorium who have county aid, I believe it should have exempted them. I feel this way not because I am here, but because it has created a very unhealthy mental attitude in a large number of the patients here. Mental equanimity is a very important part of the treatment for tuberculosis. A large debt accumulating month after month is disturbing to a well man; but to a man with tuberculosis who must necessarily look to a life of limited activity, this debt of hundreds of dollars and sometimes thousands of dollars, is appalling. Proper rest cannot be obtained. It has so disturbed many here that they have refused to remain any longer and have gone home. To be sure, their health should be more important to them than the property they have, yet some of this property does not belong to them, but to parents or relatives who had resumed the responsibility of the patient's support before he came out here. I cannot believe the law was passed with due deliberation; but until some different arrangement is made, many tuberculous patients will stay at home with disastrous results to themselves and to those with whom they come in contact.

Occupational Therapy

We have had a full time occupational therapy instructor at the institution in times past. At the present time, our occupational therapy department is being supervised by patients. Those interested, then, wander down and try their hand. I believe that this is an important part of treatment and should be developed. Many of the patients are well enough to be up and about, and they need something to keep them from becoming mentally inert. It will be necessary for most patients to change their vocation after being dismissed, if they wish to support themselves without loss of health. I believe that a capable staff of teachers is essential for rehabilitation of these patients. Whether this staff is one or more, it can be worth many times its cost by making discharged patients wholly or partly self-supporting, and by creating in them a desire to do something useful. It is not only a pitiable thing to see some of these better patients spending three or four hours a day doing nothing more than playing cards, but it is a terrific waste of human energy as well. A few of these patients will need to have encouragement to direct their energies along some useful line, if it be only education in English or history. Recovery is complete only when physical and mental conditions have become normal. Many corres-

pondence courses could be obtained without cost to the patient and used by several patients at a time and saved for future ones as well. I expect within the near future to start a movement which I hope eventually to convert into a rehabilitation program. If tentative plans work out, we will have help through the Federal recreational program. We may have one or two workers trained in the "hobby" arts to organize and conduct such a program. This will be a start, and from that, eventually this necessary department may be permanently a part of the regular sanatorium treatment.

More education on tuberculosis is needed in this state. We have one county judge who is very uncoöperative; in fact, he has suggested to applicants for entry that when we get a patient we keep him forever so that we will have a job. Of course, that is complete ignorance of tuberculosis and its treatment.

These few words on the institutional care of the tuberculous in South Dakota, I hope, will have given some insight to the work we do, how we do it, and what we hope to do in the future.

Vital Capacity Determinations in Health Examinations

Robert G. Hinckley, M.D.†

Minneapolis, Minnesota

HUTCHINSON, in 1848, advanced the conception that the vital capacity of man is a constant quantity directly disturbed or modified by four circumstances: height, weight, age, and disease. This stimulated an interest in the subject, so that over a period of years numerous studies of vital capacity were made. From the data thus accumulated, standards of normal were developed; and the relation of vital capacity to such factors as physical training, occupation, body position, posture, race, nationality, and sex was shown¹. Because of this interest and the simplicity of the test, the measurement of vital capacity came to be included as a regular procedure in the routine examination of practically all college students. There have been surprisingly few attempts, however, to evaluate its diagnostic usefulness.

At the University of Minnesota several thousand physical examinations of students are done routinely each year. For the past fifteen years such examinations have included the routine examination of vital capacity. It seemed evident, however, that little actual diagnostic use was made of these readings. The question was raised as to what immediate diagnostic value such vital capacity determinations are in examinations of relatively healthy young men and women. It was in an attempt to answer this question that the present résumé was undertaken.

Records of vital capacity used in this study were in terms of per cent of normal according to accepted standards rather than in actual cubic centimeters of expired air. This normal was the hypothetical value determined by West's² formula which is based upon surface area. Per cent of normal for each person was arrived at by comparing the actual vital capacity readings, measured with a water spirometer, with the normal determined by West's formula.

These vital capacity values were analyzed in relation to other health data on some 2,500 college entrance examinations. Analysis of the records for the two sexes was kept separately. First, the records were divided into

five groups according to the relative per cent of normal vital capacity. These percentage groups were as follows: less than 80%, 80 to 89%, 90 to 109%, 110 to 119%, and 120% or more. With certain exceptions two hundred records were included in each of these groups. The exceptions were as follows: There were 129 in the group of men with vital capacity values of 110 to 119%; 182 women for the group of 110 to 119%, and only 43 women with values of 120% or more of normal.

The means of various measurements—age, height, weight, height-weight per cent, systolic and diastolic blood pressure, and pulse—were computed for each vital capacity group. The percentage incidence of deviations of pulse exercise-response, posture ratings, and Mantoux readings were also computed for the group in each vital capacity range.

Tables 1 and 2 present the data for these findings in both sexes. In both cases the lowest mean height-weight per cent is in the lowest vital capacity range. There is a consistent increase of this mean through the groups so that the highest mean height-weight per cent is found in the group of greatest vital capacity. This one would expect, as various workers have demonstrated a correlation of vital capacity to height, weight, age, and sex. However, since the total fluctuation of height-weight percentage in women was 8.92 or less than 5% above or below normal, and for men a total of 11 or less than 5% below and not 7% above the normal, it would seem apparent that these factors, although related to vital capacity, were not the primary ones in producing the fluctuations of more than 20% above or below normal vital capacity. Also the mean age for both sexes can be discounted as a primary factor in these vital capacity groups as the greatest variation in mean age was roughly three-fourths of a year for the men and four-fifths year for the women. The data reveal no consistent or significant relationships between vital capacity in either sex with blood pressure, pulse rates, deviations of posture, or Mantoux readings.

† From the Students' Health Service and the Department of Preventive Medicine and Public Health, University of Minnesota.

TABLE I.
VITAL CAPACITY OF WOMEN AND CERTAIN PHYSICAL DATA.

% Stand. V. C.	Less Than 80 %	80-89 %	90-109 %	110-119 %	120 % or More
Mean Age	20.10±.08	20.11±.07	19.28±.07	19.67±.08	19.58±.15
Mean Height	63.24±.11	63.80±.12	63.72±.11	64.63±.11	64.24±.26
Mean Weight	117.21±.82	121.47±.77	123.86±.83	130.46±.90	132.14±2.20
Mean Ht. Wt. %	95.84±.59	97.98±.58	100.25±.57	103.45±.63	104.76±1.12
Mean Systolic Blood Pressure	114.57±.51	113.43±.50	118.00±.60	115.88±.56	116.28±1.52
Mean Diastolic Blood Pressure	72.61±.48	71.46±.46	73.07±.41	71.63±.51	70.00±1.20
Mean Pulse, Sitting	86.35±.56	86.35±.70	89.45±.61	85.61±.68	88.02±1.34
Pulse 2 minutes after exercise—(Following figures indicate percentage of group)					
Sitting rate or less	67.17±2.3	59.30±2.4	38.95±2.6	42.70±2.5	50.00±5.2
1-5 more	16.67±1.8	20.60±1.9	17.44±2.0	28.09±2.3	4.76±2.3
6-10 more	12.63±1.6	10.55±1.4	12.21±1.7	15.73±1.9	19.05±4.1
Posture A	5.20±1.1	3.31±0.9	3.01±0.9	6.13±1.3	6.06±2.8
Rating B	68.21±2.4	67.40±2.4	34.34±2.5	49.08±2.6	51.52±5.9
Rating C	25.43±2.2	28.18±2.2	55.42±2.6	40.49±2.6	36.36±5.5
Rating D	1.16±0.5	1.10±0.5	7.22±1.4	4.29±1.1	6.06±2.8
Positive Mantoux	38.79±2.3	39.29±3.2	33.58±2.2	30.33±2.3	36.36±4.9
Negative Mantoux	61.21±2.3	60.71±3.1	66.42±2.2	69.67±2.3	63.64±4.9
Number of Cases	200	200	200	182	43.

TABLE II.
VITAL CAPACITY OF MEN AND CERTAIN PHYSICAL DATA.

% Stand. V. C.	Less Than 80 %	80-89 %	90-109 %	110-119 %	120 % or More
Mean Age	20.21±.10	20.62±.10	20.61±.09	20.69±.10	19.91±.08
Mean Height	67.47±.14	67.81±.12	68.36±.12	69.42±.11	70.15±.11
Mean Weight	131.28±.89	136.22±.81	140.34±.76	152.27±.75	156.93±.90
Mean Ht. Wt. %	95.41±.63	98.97±.46	99.62±.55	104.44±.44	106.41±.58
Mean Systolic Blood Pressure	122.54±.75	122.30±.53	122.98±.56	121.21±.55	124.40±.58
Mean Diastolic Blood Pressure	76.59±.49	77.30±.41	78.34±.42	76.23±.38	77.53±.58
Mean Pulse, Sitting	85.47±.63	81.65±.58	85.80±.63	80.45±.54	82.75±.58
Pulse 2 minutes after exercise—(Following figures indicate percentage of group)					
Sitting rate or less	51.66±2.8	49.75±2.4	42.93±2.4	44.27±2.4	43.65±2.4
1-5 more	24.50±2.4	28.93±2.2	27.27±2.2	30.21±2.2	26.40±2.2
6-10 more	11.92±1.9	13.71±1.7	21.72±2.0	13.54±1.7	17.26±1.8
Posture A	7.55±1.5	7.69±1.3	5.12±1.1	8.33±1.3	3.05±0.8
Posture B	56.60±2.6	50.26±2.4	50.51±2.4	59.44±2.5	49.75±2.4
Posture C	32.70±2.6	38.97±2.4	42.47±2.4	31.11±2.3	46.19±2.4
Posture D	3.14±0.9	3.08±0.9	2.06±0.7	1.11±0.7	1.02±0.5
Positive Mantoux	35.58±3.2	37.12±2.8	31.39±2.7	31.85±2.2	31.91±2.7
Negative Mantoux	64.42±3.2	62.88±2.8	68.61±2.7	68.14±2.2	68.08±2.7
Number of Cases	169	200	200	200	200

Second, the percentage incidence of a history of rheumatic fever, St. Vitus dance, pneumonia, influenza, tuberculosis, and pleurisy was determined from the students' past medical histories. The same was done for family histories of tuberculosis, apoplexy, kidney trouble, high blood pressure, and heart disease.

Table 3 shows the frequency with which these disease conditions were reported by the students, both for themselves and for their families. The absence of any consistent relationship between these conditions and vital

capacity is apparent. It is perhaps interesting to note that pneumonia, influenza, and pleurisy were reported most frequently by the lowest vital capacity group of both sexes, but even here the differences in incidence throughout the vital capacity groups is not consistent. Also, for these data, the number reporting family or past medical history of each disease in most cases is very small.

A third approach was to determine the mean vital capacity of individuals with certain known physical con-

TABLE III.
INCIDENCE OF VARIOUS DISEASES IN PERSONAL AND FAMILY HISTORIES *

Per Cent of Normal Vital Capacity

STUDENTS' HISTORIES		Below 80 %	80-89 %	90-109 %	110-119 %	120 % or More
Rheumatic Fever	Male	1.8 %	3.0 %	3.0 %	2.5 %	3.0 %
	Female	5.5 %	1.0 %	3.5 %	1.7 %	2.3 %
St. Vitus Dance	Male	1.2 %	.0 %	.5 %	.5 %	.5 %
	Female	1.0 %	1.0 %	1.5 %	.0 %	.0 %
Pneumonia	Male	21.7 %	15.5 %	12.0 %	18.0 %	10.0 %
	Female	16.5 %	14.0 %	14.5 %	15.4 %	11.6 %
Influenza	Male	72.3 %	40.0 %	45.0 %	47.0 %	59.5 %
	Female	51.0 %	52.0 %	54.0 %	52.8 %	62.8 %
Tuberculosis	Male	1.8 %	1.0 %	.0 %	1.5 %	1.5 %
	Female	.0 %	.0 %	.5 %	.6 %	.0 %
Pleurisy	Male	8.3 %	5.5 %	7.0 %	7.0 %	5.5 %
	Female	6.0 %	2.5 %	2.5 %	3.5 %	2.3 %
FAMILY HISTORIES						
Tuberculosis	Male	10.1 %	14.1 %	13.5 %	12.1 %	13.5 %
	Female	13.5 %	18.0 %	17.5 %	18.1 %	25.6 %
Apoplexy	Male	9.5 %	14.1 %	19.0 %	20.1 %	18.1 %
	Female	18.0 %	23.5 %	16.5 %	17.6 %	13.9 %
Kidney Trouble	Male	6.5 %	18.7 %	9.5 %	12.6 %	14.5 %
	Female	17.5 %	18.5 %	14.0 %	14.8 %	18.6 %
High Blood Pressure	Male	18.9 %	21.6 %	20.0 %	24.5 %	18.1 %
	Female	25.5 %	28.5 %	24.5 %	22.0 %	16.3 %
Heart Disease	Male	21.9 %	17.6 %	19.0 %	20.5 %	21.6 %
	Female	26.0 %	20.5 %	21.5 %	24.7 %	11.6 %
Total Number Records in Division	Male	169	200	200	200	200
	Female	200	200	200	182	43

* In a few cases the histories were not complete. Such cases were excluded from the computations.

ditions which presumably might affect the vital capacity. Groups with tuberculosis, suspicious lung findings, elevated blood-pressure, heart defects, asthma, and diaphragmatic pleurisy were selected for this purpose. The individuals under each condition were limited to white males within ten per cent of their standard height-weight and between 18 and 24 years of age. This method stabilized more or less such factors as race, sex, height, weight, and age. All tests were made while patients were standing and therefore the factor of position was the same. A similarly limited group of one hundred individuals with no noted abnormalities was included for comparison. As may be seen by Table 4, the only condition studied in which there was a significant decrease in the per cent of normal vital capacity was diaphragmatic pleurisy. However, the groups with active and arrested tuberculosis, suspicious chest findings, organic heart defects, and asthma had a mean vital capacity percentage lower than the normal group. The groups with elevated blood-pressure and functional heart defects had mean vital capacity percentages above the normal group. These fluctuations, however, were not marked.

Summary

1. Vital capacity deviations from the normal in relatively healthy individuals are apparently much more closely related to age, sex, stature, and weight than to any of the health data studied. These data included blood-pressure, pulse, pulse exercise response, deviations of posture, Mantoux readings, and past medical and

TABLE IV.
VITAL CAPACITIES IN CERTAIN DISEASES

Diagnosis	No. Cases	Mean V. C. % Normal	P. E.
Active Pulmonary Tuberculosis	2	90.00	
Healed or Arrested Tuberculosis	16	90.88	±2.29
Suspicious Chest Findings	116	98.36	±.79
Blood Pressure (Systolic 140+)	100	102.00	±.63
Blood Pressure (Diastolic 90+)	100	100.10	±.75
Heart Defects—Functional	105	99.86	±.67
Heart Defects—Organic	69	94.57	±.83
Asthma	24	95.42	±1.79
Pleurisy, diaphragmatic	12	88.33	±1.83
No Defects or Abnormal Findings	100	98.70	±.64

family histories of rheumatic fever, St. Vitus dance, pneumonia, influenza, tuberculosis, pleurisy, apoplexy, kidney trouble, high blood-pressure, and heart disease. Age, sex, stature, and weight, which might be considered normal variables in vital capacity measurement, are determined separately in each examination and are not interpreted from vital capacity, so that their relationship to it is of little value.

2. Certain functional and organic conditions noted on these health examinations show some relationship to variation in vital capacity. The conditions included were active and healed tuberculosis, elevations of blood-pressure, functional and organic heart defects, asthma, and chronic diaphragmatic pleurisy. Also the variations of vital capacity in these relationships, except possibly for diaphragmatic pleurisy, are hardly great enough to be outside the variability of the test itself when applied to any one individual. The diagnostic value of these

relationships is negligible because there are so many other variables that one cannot be certain that the condition studied produced the vital capacity change.

3. In the groups of individuals with more serious grades of pathological conditions, the test might have a greater diagnostic value; but it appears to be of little

value for this purpose in the routine examination of relatively healthy young men and women.

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The Management of Nephritis*

W. H. Long, M.D.

Fargo, North Dakota

A CONSIDERATION of the management of nephritis is necessarily divided according to the separate types of the disease encountered. There have been many classifications of nephritis based on the various authors' conceptions of the correlation of pathological, clinical and functional features of the disease. To me, there is none so understandable and yet so ample as that of Christian. His article in the *Journal of the American Medical Association* for January 20, 1934, should be kept in every practitioner's files, and reference to it will clarify many doubts when these cases present themselves.

His classification is as follows: (1) acute nephritis and subacute nephritis with two sub-groups (a) with edema (nephrotic syndrome) and (b) hemorrhagic nephritis, (2) chronic nephritis (a) with renal edema, (b) without renal edema, (3) essential hypertension progressing to chronic nephritis, and renal arteriosclerosis progressing into chronic nephritis. This resolves itself into essential factors as to the origin of the disease; first, the acute nephritis associated with an infectious process, which may progress into chronic nephritis, and second, the degenerative changes of vascular disease which lead to the same type of kidney lesion.

The acute type, then, is always a complication or sequela of infection. The infection is most likely to be of streptococcal origin, scarlet fever, a common cold or sinus infection, a tonsillitis, or a surgical infection. The prevention of acute nephritis resolves itself into the careful and adequate management of these diseases. But in spite of all care, many such infections will initiate an acute damage to the glomeruli, and frequent and complete urinalysis in such cases will reveal many mild cases of nephritis. It should be emphasized that it is the mild cases which are likely to escape diagnosis and adequate care, and that they are as likely to end in typical chronic nephritis as the more severe ones. This is very obvious in obtaining histories from individuals in the chronic stage. So often, only the fact that there was an infectious disease and that there was albumin found, is obtained; and too often it is seen that no adequate treatment was given.

The reason that more consideration of these mild forms is not given is the frequency of benign albuminuria

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in febrile states, the so-called "febrile albuminuria." Therefore, it is essential to make complete urinalyses, for surely the finding of red blood cells and granular casts and albumin is sufficient to label such cases true nephritis. Also, if albumin is once found, subsequent urinalyses must be made, and if it persists for an appreciable time after the infection has subsided, then there can be no doubt. Blood pressure readings at this time, while not necessarily extreme, will often be elevated. Especially significant are diastolic pressures above 90.

The frank cases with marked nephritic edema or those with hemorrhagic urine need no special word. The management of both should be equally strict, if we are to succeed in preventing the progression to the chronic stage. And it is surprising how completely the most severe case may recover. The management of these acute cases, of whatever severity, consists of complete bed rest until the signs of active infection have disappeared. This will usually require six to 12 weeks. The best indication of healing will be diminution or disappearance of albumin, red blood cells and granular casts in the urine. If, after three months, there is still a little albumin and a very few red blood cells, it is likely that this stage will continue indefinitely, and such patients may be allowed to be about cautiously.

The diet in the acute stage must be adequate. There is no need for avoidance of any type of food. The caloric intake must be sufficient to avoid wasting. Strict protein restriction is not necessary. Milk and fruit juices are adequate for the first week or two, while gastro-intestinal symptoms are prominent. Then the diet should be increased to include vegetables, cereals, and a small amount of meat and eggs, so that protein loss may be replaced.

Special symptoms that may require consideration in the acute stage are anuria, convulsions, and edema.

Anuria will usually respond to adequate fluid intake by mouth. If it does not, then glucose in 20 to 50 per cent solution by vein in amounts from 50 to 200 cc. is given. Cupping over the kidney, and the use of diathermy through the kidney region, have occasionally started the flow. If these measures fail after three or four days and the urea is rising, decapsulation of the kidney should be considered.

Edema is usually transient, but if it persists unduly, digitalis should be given. Salt restriction should be enforced, and mild diuretics such as potassium nitrate may be tried. Salyrgan has been recommended in this stage, but I do not consider it advisable. Sweating is of very little value, and catharsis is likely to do more harm than good.

Convulsions and uremic manifestations are rare in the acute stage. When threatening, venesection and the use of sedatives such as chloral hydrate are in order. Injectable barbiturates (as allurate injectable) are valuable here in allaying the nausea and controlling the seizures. Hypertonic glucose by vein and spinal tap are frequently necessary.

The subacute stage requires, largely, enforcement procedures. See that the patient is kept in bed until the urinary findings are normal. See that the protein intake is adequate to prevent the development of edema from protein insufficiency. It has been shown that plasma proteins are normally seven per cent, and that if they fall below five per cent, this in itself causes edema of the "hydremic type." The caloric requirements must be met. This state may continue for three to six months. The prevention of upper respiratory infections is most important, as these are very likely to result in exacerbations of the disease. Foci of infection, especially diseased tonsils and sinuses, should be treated. Iron is often needed for the anemia.

When edema is the principal problem in this stage, it may be of the so-called nephrotic type. Some students prefer to consider nephrosis a separate disease entity. The criteria for such a diagnosis being prominent edema, large amounts of albumin and no red blood cells in the urine, and a virtually normal blood pressure. Long observation of such cases, however, reveals that most of them terminate as chronic glomerular nephritis. There are certain special features of value in their treatment, however; that is high protein feeding which often results in marked diuresis. Thyroid feeding is also recommended. Salyrgan can safely be used in these cases.

The chronic stage of nephritis leads to a consideration of terminal events. The hypertension with attendant headaches can be modified only symptomatically. The gastric irritability of mild uremia is trying, and sedatives such as codein, bromides and barbiturates are indicated. The food the patient wants had better be allowed. Active bowel elimination must be had, best by the milder laxatives; strong purgation depletes the patient unduly. Spinal puncture has been very helpful for the intractable headaches.

Edema in the chronic stage is frequently troublesome. It is often due to cardiac failure from the long standing hypertension. Such edema yields promptly to adequate digitalis therapy. The presence of hypertension is not a contraindication for digitalis administration. Fluid restriction and salt restriction are enforced. Diuretics in this stage are less harmful and more likely to be efficacious than in the acute stage. Potassium nitrate

is the one of choice, and is used in doses of 3 to 6 grams daily. It is less toxic than the ammonium salts and does not produce an acidosis. When there are no red cells in the urine, and other measures have failed, salyrgan may be used. At times all these measures fail and paracentesis is necessary.

Uremia is treated as in the acute stage by venesection. If the hemoglobin is low, transfusion should follow. Injectable barbiturates are of the greatest value to prevent and control convulsions. If an acidosis exists, sodium bicarbonate by vein is indicated when vomiting is present. If no acidosis exists, then ten per cent glucose in Ringer's solution is given by vein.

A word should be said about the nephritis of pregnancy. It is necessary to differentiate between the frank toxemia of pregnancy in a previously normal kidney, and the exacerbations due to the pregnancy in previously existing latent or mild nephritis. This problem resolves itself into careful history taking. Such a differentiation is not always possible. But it is always possible to follow these cases over a sufficient time following delivery to be sure that no permanent kidney damage is present. These patients in whom the blood pressure remains elevated and even mild albuminuria and casts continue for a period of months, had best be protected from further pregnancies, because each ensuing pregnancy is likely to damage further the renal function.

Our own experience with these cases is that there are a large number with permanently damaged kidneys, progressing as other chronic nephritides. The actual percentage one can expect to be so damaged is pretty well predicted by Herrick and Tillman's study of 594 such cases followed from one to 22 years. In this large group, more than one-half were found to present evidence of either glomerular nephritis or hypertensive cardiovascular disease within three years.

This paper has so often emphasized the importance of adequate protein intake that it might be well to discuss the reasons for such a positive opinion. The question of protein in nephritis has been seriously considered by a number of the best students of the disease.

Christian says "only with a rising value of blood nitrogen is there any reason for marked dietary restriction."

McCann, from an analysis of experimental and clinical data, says, "These experiments have convinced us that liberal protein allowances in the diet do not of themselves injure the kidneys. . . . Full advantage should be taken of the tendency to deposit protein by all individuals who have lost it, either by inanition or by toxic destruction or through albuminuria."

Meakins states, "Do not reduce proteins to an absurdly low level when the patient is constantly losing proteins. In the final stage you can reduce the protein to some extent, if only to help the patient from over-eating."

In closing I would emphasize the following points:

(1) Take care to detect the milder cases which may arise from any acute infection, especially the streptococcal infections.

(2) Do not starve these patients in the acute stage. Feed diets to maintain the patient's strength, and give adequate protein for replacement of that lost through albuminuria.

(3) Enforce prolonged bed rest until the disease becomes quiescent, the edema gone, and the urine virtually clear.

(4) Remove active foci of infection and protect against upper respiratory infections.

(5) In the subacute and chronic stages enforce moderation in food and activity, and give an adequate diet with an average protein intake.

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Acute Abdominal Disease*

Claude F. Dixon, M.D.†

Rochester, Minnesota

MANY in this audience have very definite ideas regarding the management of most acute abdominal conditions; at least, it would be difficult to find a surgeon who would not willingly confess this, and I am here, I suppose, to make my confession along with the others. I propose to consider briefly acute appendicitis, acute intestinal obstruction, perforated peptic ulcer, acute disease of the gallbladder and acute pancreatitis.

Acute Appendicitis

Unruptured gangrenous appendix:—Not infrequently older contemporary surgeons have stated that an appendicectomy may be one of the most difficult of abdominal operations. I heartily subscribe to the statement, as I have encountered many retrocecal, unruptured, gangrenous appendices that required a considerable amount of something—call it skill if you like—in order to perform an appendicectomy without bringing about perforation. How often one hears the remark, "Just an appendix," when inquiry is made regarding an operation! But, if one actually collects the statistics throughout the United States, it is obvious that deaths occur following removal of unruptured acute appendices, and that the death rate is entirely too high. It is evident that the facts concerning this situation have not been stressed as they should be.

Let us examine some of the factors which contribute to the high mortality from appendicitis. Within the past month, a young physician came to me and said that he was about to take the practice of a rural physician, and that it was for this reason he had come to spend a few days making observations in the Clinic in order that he might learn to do some of the simpler types of operations, for example, appendicectomy. Frankly, I think that full experience with the operation would have a favorable effect on the mortality from appendicectomy, and that the factor next in importance is that the operation is often performed after a snap diagnosis

and without proper indications. Generalized abdominal pain, diarrhea, and possibly vomiting, may occur without being attributable to a diseased appendix. These symptoms may be referable to a type of enteritis, manifested by reddening and congestion of the parietal peritoneum, small intestine and colon, and even gentle manipulation of the bowel would be attended with considerable risk. In some of these cases, if only the appendix were removed, the patient might make a fairly satisfactory convalescence, but, since the surgeon is somewhat chagrined at finding only a shriveled appendix, an extensive abdominal exploration may be carried out which will produce sufficient trauma to cause the acute infectious process in a portion of the intestinal tract to become generalized, and peritonitis may be precipitated. I cannot urge too strongly against carrying out an exploratory operation in this type of case. It would be far better to admit error or confine the procedure to removal of a so-called chronic appendix. Furthermore it behooves all of us to cease minimizing the dangers incident to the removal of a diseased appendix. Even though there may be little risk if the surgeon is well-trained, there will be some experiences that are far from pleasing, due to the extremely poor condition of the patient at the time he presents himself for attention. However, the risk should be so small that every fatality would be looked on as an unusual tragedy. Facing matters squarely, the situation may be considered from still a different angle. The mortality may be only a few per cent if each surgeon reviews only his own experiences, but to the family in which a death occurs, the mortality is 100 per cent. My opinion regarding treatment of acute appendicitis, complicated and uncomplicated, will most likely not meet with the approval of all of you, but I shall tell you about my experiences in the hope that I may say something helpful.

Rupture of the appendix:—In cases in which, according to the history, it is reasonable to assume that the appendix ruptured only a few hours previous to consultation, an examination will reveal generalized rigidity of the abdominal muscles which is so marked

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† Division of Surgery, the Mayo Clinic, Rochester, Minnesota. Associate professor of surgery, University of Minnesota Graduate School of Medicine.

that one might be justified in suspecting the presence of a perforated peptic ulcer. Let us assume, however, that the diagnosis of perforated appendix is correct. In such cases, I feel that the best plan is to institute drainage through a right rectus or a McBurney incision. Two Penrose cigarette drains are inserted, one of which points upward toward Morrison's pouch and the other is directed downward into the pelvis. No attempt is made to visualize the appendix, and there is no exploring whatever. Usually, if there has been severe pain before the operation, this ceases soon after drainage is established. Some surgeon has said that it is impossible to establish adequate drainage of the abdominal cavity in this manner; this may be true, but in a case in which the appendix has ruptured, scattering pus throughout the abdomen, and there is no attempt at localization of the process, drains properly placed will permit the pus to be discharged freely. About the seventh postoperative day it is justifiable to begin loosening and shortening the drains preliminary to removing them on about the twelfth postoperative day.

Let us consider another type of perforated appendix. A typical attack occurs, and the pain becomes localized in the right lower abdominal quadrant; then, six to eight hours before the patient's admission to the hospital, the rather severe pain ceases suddenly, indicating that perforation has taken place. Physical examination reveals muscular spasm confined almost entirely to the right lower abdominal quadrant. From my observations and from the review of many hundreds of histories of similar cases, an operation at this stage of the disease is most likely to thwart nature's efforts to make the process a local one. If surgical intervention is undertaken at once, complications such as diffuse peritonitis, pelvic abscess and subphrenic abscess ensue. Although it is possible to remove the appendix in some such cases and have recovery ensue, the risk is much less if a medical regimen is employed. Drainage of a well-localized appendiceal abscess should be established after the body temperature has reached normal or nearly normal. The appendix is not removed, even though it is easily accessible. Does it not seem reasonable that removal of the ruptured appendix would encourage spread of the infectious process? Study of a large series of such cases appeared to bear out that contention for the death rate was not only appallingly high, but in many instances death was attributed to subphrenic or subdiaphragmatic abscess and empyema. Needless to say, an appendix which has perforated ultimately should be removed; usually this can and should be done in a period of two or three months.

I have compiled a table showing the results in 523 cases of all types of acute appendicitis which were managed according to the methods described. (Table 1.) Fortunately the mortality rate is somewhat lower at present, and I attribute this to the measures employed for the control of peritonitis. Priestley and I have been using an anaerobic serum which was originally suggested by Weinberg of the Pasteur Institute as a result of the

feeling that many anaerobic bacteria are perhaps more pathogenic than they were formerly supposed to be. Before giving the serum, the patient is desensitized; then 20 cc. of the serum in 200 to 300 cc. of physiologic saline solution are administered intravenously. The procedure may be repeated two or three times in 24 hours.

As stated in the beginning, the plans I have so briefly outlined may not meet with your approval, but I have found them helpful and submit them to you, because they represent my best judgment in the matter.

Acute Intestinal Obstruction

During the past decade, definite progress has been made in the treatment of acute intestinal obstruction. There was marked change in our concept of the entire situation following recognition of the fact that the most marked change in the chemical composition of the blood is an alkalosis, and not acidosis, as was formerly believed. Pre-operative decompression by nasal siphonage, as suggested by Wangensteen, is a comparatively recent maneuver which has proved of great advantage; at times it saves the life of the patient. If difficulty is experienced in passing the tube into the duodenum, the maneuver will be accomplished rather easily by placing the patient on his right side, and allowing him to have frequent sips of water while the tube is being inserted. Roentgenologic examination of the abdomen with the patient in a sitting position will show whether or not the tube has entered the duodenum. It must be remembered that patients lose an enormous amount of fluid by use of a suction apparatus and therefore the fluid balance must be maintained by the administration of fluids intravenously and subcutaneously; usually 3000 to 4000 cc. of fluid should be given in 24 hours. The solution I prefer if the blood chlorides are normal is five per cent glucose. This solution is nearly isotonic, and furnishes the patient with both food and water. Physiologic saline solution combats the toxicity of intestinal obstruction to a considerable extent, but one must remember that it is possible to administer an oversupply of salt and thereby defeat the purpose because, if the chloride content of the blood plasma is raised high above normal, fluid from the tissues is drawn into the circulation and dehydration is increased. Intranasal suction performs two important tasks: first, after complete decompression has been brought about, the obstructed segment may be freed so that operation is unnecessary; second, it is an aid in preparing the patient for the operation if one is required.

Finally, the possibility of closed-loop intestinal obstruction must be kept in mind. A small segment of bowel may be caught in a mat of adhesions in such a manner as to occlude it proximally and distally. I have seen three or four cases in which there was no clinical evidence of intestinal obstruction, but necropsy disclosed that a segment of intestine eight to ten inches (20.3 to 25.4 cm.) had been occluded in this way. The blood supply was not impaired. An enterostomy or an entero-anastomosis had been made proximally, so that the intestine was functioning normally and yet the patients

TABLE I.
SUMMARY OF CASES OF APPENDICITIS

Type of Appendicitis	Cases	Operation	Mortality	
			Cases	Per Cent
Acute, diffuse, purulent and gangrenous	437	Appendicectomy without drainage	0*	0.0
Ruptured, localized abscess	38	Extraperitoneal drainage	3	7.7
Ruptured with diffuse and spreading peritonitis	48	Abdominal drainage	5	10.4
Total	523		8	1.52

* One patient died 12 days after operation from exacerbation of a cerebral condition of long standing. The abdomen was clean.

succumbed; apparently the cause of death was an uncontrollable imbalance in the composition of the blood which was characterized by alkalosis. Therefore, if the blood does not return to normal in a case in which occlusion has been relieved, exploratory laparotomy is indicated, as a closed loop may be found to be the cause of the trouble.

Acute intestinal obstruction which has been present only a few hours may be rectified without great risk in most cases. When the obstruction is of longer duration, duodenal siphonage should be instituted and intravenous therapy begun. If the patient's condition improves, the tube may be clamped off to determine whether or not the obstruction has been released. If it has not, surgical intervention should be carried out. Roentgenologic examination of the abdomen always should be made to determine the situation of the occluded segment of intestine.

Perforated Peptic Ulcer

The management of perforated peptic ulcer is a surgical problem. The length of time that has elapsed since the perforation should be taken into consideration in determining the type of surgical procedure to be employed. If the exploratory operation can be carried out within an hour or two following perforation, excision of the ulcerated intestine and gastroduodenostomy, or closure of the perforation and gastro-enterostomy, might be employed with a comparatively low mortality. However, one rarely has an opportunity to care for a patient so soon after perforation of an ulcer, and it is my plan in almost 100 per cent of such cases to close the perforation and do nothing more. Over the area I usually suture omentum, and when this is not easily available, I divide the suspensory ligament of the liver and use one end of it as a patch over the anterior surface of the duodenum. One patient was admitted 60 hours after perforation of the duodenal ulcer and recovered following closure of the perforation, which was carried out under local anesthesia. About 30 per cent of the patients with perforated peptic ulcer who have come under my observation have given no history of previous digestive disturbance whatsoever. More than half of those on whom I have operated for this condition have been imbibing freely of alcoholic beverages. Possibly the reason that more fatalities have not occurred is that the alcohol that is ingested aids in rendering the gastric contents sterile. If there is an appreciable quantity of gastric contents (particles of food) in the peritoneal cavity, drainage seems a most reasonable procedure. To institute drainage, I make a small stab wound in the lower middle portion of the abdomen

midway between the symphysis pubis and the umbilicus, and a soft tissue rubber drain is then placed, with the proximal end so situated as to afford pelvic drainage; abscesses in the pelvis are more frequent following this catastrophe than is generally supposed. The drains are not disturbed for seven to ten days, after which they are removed gradually.

Acute Disease of the Gallbladder

Those who believe that an acutely diseased gallbladder should be removed argue that the condition deserves the same type of surgical management as does an acutely inflamed appendix. In other words, there is still considerable discussion as to whether cholecystectomy or a cholecystostomy should be carried out or whether operation should be postponed. In a recent symposium, a mortality of ten per cent was reported for a series of 100 cases in which cholecystectomy was performed for acute cholecystitis. It seems to me that the mortality might have been lower had the attack been allowed to subside before subjecting the patients to operation. It is my opinion that cholecystectomy should be deferred for two or three weeks following an acute attack. Occasionally, localized tenderness persists following such an attack, and the body temperature remains elevated to 103° or 104° F. In this type of case, I prefer to perform cholecystostomy and remove any stones that may be present, for this operation can be carried out by the use of local anesthesia and with comparatively little risk. Furthermore, the edema present during the acute stage enhances the danger of injuring the common bile duct while performing cholecystectomy.

Pre-operative and post-operative pain:—McGowan has shown recently that the pain occurring with disease in the biliary system is attributable, in a large majority of cases, to distention of the common bile duct resulting from spasm of the sphincter of Oddi. By injecting an opaque substance into the common bile duct through a T-tube, he found that the material would be retained in the duct if morphine recently had been administered. It therefore seems illogical that morphine should be employed during the acute phase of gallbladder colic. Relief of pain is obtained if the dose of morphine is sufficiently large to impair the higher centers; in small doses it will actually increase the patient's discomfort. But, if glyceryl trinitrate is administered or amyl nitrite inhaled, the sphincter of Oddi usually relaxes almost immediately, allowing the opaque material to pass rapidly into the duodenum. This observation constitutes a distinct advance in the understanding and management of cholecytic disease.

It should also be kept in mind that at times the etiologic process is a definite cholangitis which eventually will require prolonged external drainage of the biliary system by means of a T-tube placed in the common bile duct.

Acute Pancreatitis

About 70 per cent of the patients who have acute pancreatitis give a history of disease of the gallbladder and until recently the consensus seemed to be that drainage of the gallbladder and lesser peritoneal cavity was the procedure of choice in the management of acute processes in the pancreas. In Dragstedt's experimental studies on animals, he found that the predominating organism associated with pancreatitis is *Clostridium welchii*, and reasoned that the necrosis which occurs during the acute phase of pancreatitis is caused by bile salts, and that the hemorrhages which so frequently accompany this condition are most likely protective phenomena against toxicity of the bile salts. The mortality from cholecystostomy is extremely high because the patient is usually in rather marked shock as a result of the disease before the operation is begun, and because surgical interference tends to disseminate the infection which nature attempts to localize in the lesser peritoneal cavity. I know of no work that has thrown more light on the cause and treatment of acute pancreatitis than that of Dragstedt. The clinical application of his findings is that acute pancreatitis is an infectious process, and surgical interference is positively contraindicated.

My experience teaches that the best type of management of this condition is absolute quiet, transfusion of blood, and administration of physiologic saline and glucose solutions intravenously. The majority of patients will recover if treated in this manner, and at a later date attention can be given to the disease of the gallbladder, which so frequently coexists.

Enemas

I mention the subject of enemas last because what I have to say pertains to the treatment of all of the processes I have discussed, and, furthermore, because I wish to emphasize strongly the dangers attending the employment of the procedure. An enema given on the third or fourth day after operation is comparable to the administration of a cathartic in the course of an attack of appendicitis. A study of postoperative hospital records shows clearly that serious difficulty not infrequently succeeds a series of enemas ranging from injections of soapsuds to mixtures of milk and molasses. Some patients are able to stand the treatment, but more often than is realized, complaints follow which are thought to be of little consequence, but which finally culminate in definite signs of shock. For two or three days the patient may be nauseated and may vomit occasionally; meanwhile, the temperature becomes elevated and the pulse is rapid. There seems little doubt that peritonitis can be precipitated by such a procedure, especially if an ambitious nurse decides that a high enema is in order. If abdominal discomfort (gas pain) occurs and is not relieved by insertion of a rectal tube, the better plan is to apply hot compresses to the abdomen and to instill gently into the rectum two or three ounces (60 to 90 cc.) of warm mineral oil or olive oil, which the patient is asked to retain for four or five hours. The desired results may be obtained by this treatment, and certainly it does not impose the dangers attending distention of the bowel by the use of a large quantity of fluid. The practice of prescribing enemas within the week following abdominal operations should not only be discouraged but should be abandoned.

Initial Care and Treatment of Accidental Injuries*

R. H. Waldschmidt, M.D.
Bismarck, North Dakota

THE PROGRAM COMMITTEE requested me to present a paper on the "Initial Care and Treatment of Accidental Injuries." This is a very broad subject, and it has been difficult to decide just what special features might be taken up most profitably in the short time allowed.

If a text were required for a contribution of this sort, it might appropriately be a quotation from one of the leading surgeons of the world who said, "The fate of the wounded rests in the hands of the one who applies the first dressing. The kind of antiseptic used must remain with the man employing it."

After much experimenting with many kinds of antiseptics, the surgical consensus seems to be swinging back to iodine as the safest and best disinfectant, whenever

antiseptic wound treatment is advisable. But more and more surgeons are now discarding all use of antiseptics in many situations where formerly they were thought indispensable. It has been shown that all antiseptics do harm to the body tissues, and by so doing, interfere with prompt and normal healing. Instead of using iodine or other antiseptics in open wounds, nothing but soap and sterile water are used to cleanse the surrounding areas and the wound. However, soap and water must not be applied in the same haphazard manner in which we were in the habit of applying tincture of iodine over traumatized surfaces. It requires a thorough and methodical washing and rinsing of the wound and its surroundings with the materials mentioned.

The following outline is recommended in the early treatment of an open wound due to a recent injury. A

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sterile gauze sponge or dressing is held firmly against the wound. The skin surrounding the laceration is then washed thoroughly with soap and water. Both should, of course, be sterile and the washing must be continued for at least eight or ten minutes. The wound itself is then washed gently but thoroughly with the same materials. All destroyed and necrotic shreds of tissue are now removed with knife or scissors, and the wound is again thoroughly rinsed by pouring a large quantity of sterile water over it. If this treatment is applied within the first six hours or so after the injury, it is usually possible to obtain primary healing. This is true even when severed muscles, tendons and nerves require suturing.

In our own experience, we have found that wounds treated by this method have healed with less irritation, fewer complications and with much more satisfaction to both doctor and patient than was the case during a former era, when antiseptics were the chief and often the only weapons used against wound infection.

In dealing with superficial injuries, it is necessary to visualize all the possibilities for damages to deeper structures. Apparently slight contusions, sprains or abrasions may be very painful and disconcerting to the patient and cause him to disregard for the time other signs and symptoms pointing to injuries in the skeleton or to the internal viscera. The wise medical man, when meeting a recent injury, will not be satisfied with a cursory examination, but will insist on knowing whether or not there may be other anatomic damage present, which has not yet had time to become evident. Many permanent deformities, disfiguring scars, functional defects and medico-legal problems may be obviated by an early search for concealed injuries. Here again the patient's fate rests in the hands of the first medical consultant.

The primary object of first aid treatment is to save life. If wounds are present, these should be covered with sterile dressings, but no attempt should be made to cleanse the wounds on a patient lying on the street, on the highway, or in any place where the cleansing process of necessity must be incomplete. Hemorrhage, if of serious degree, must be controlled by pressure or tourniquet. Morphine should be given freely for pain. If shock is in evidence, or the distance to the hospital is great, it is very essential that artificial heat in some form be maintained until the patient is placed in bed.

Scar formations, which may be either disfiguring or crippling to the patient, are inevitable after many injuries where extensive tissue necrosis has taken place. Primary or secondary infection with virulent bacteria may terminate in additional destruction and removal of important tissues. Much of the damage produced in this manner is unavoidable. However, it can be limited to a minimum, if the medical man who first sees the injured individual renders scientific, careful and purposeful treatment and advice.

The prophylactic use of combined tetanus and gas gangrene antitoxin may not be as universally important after injuries on the highway as on the farm. Each case must be considered by itself in this regard, while remem-

bering that both of these types of anaerobes are very common throughout our state, and neither is confined to any location or condition. When in doubt, it is usually safest to practice prophylaxis.

Burns of different degrees of severity are often brought to the medical man for treatment. Liberal doses of opiates should be given at once to relieve pain and to prevent shock, if not already present. Shock should be treated by the application of artificial heat and the administration of fluids by any and all methods available. Stimulants are often indicated.

For the local treatment of burns of the second and third degrees, we have had the most satisfactory results from the use of ten per cent tannic acid solution sprayed over the affected area every fifteen minutes until the surface has become coagulated. The firm eschar formed will protect the underlying tissues from the air. Thereby, the pain is relieved, body heat is preserved, fluid loss is decreased and infection is minimized. A ten per cent silver nitrate solution may be added to expedite coagulation.

The motorization of our entire population has caused a tremendous increase in the number and variety of skeletal fractures. Very nearly a million fractures are treated annually by the doctors of the United States. The time limitation precludes more than a mere mention of this most important feature of accidental injuries. Through the efforts of the American College of Surgeons, the treatment of fractures has now become practically standardized. As a result of this activity, a very intense interest is being taken in this subject in the effort to improve the results. This does not refer merely to the acquisition of more modern splints and other appliances for the best kind of first aid application, but it has a greater reference to a wider and deeper mental training and equipment for the purpose of improved handling of recent fractures. Here is a challenge, therefore, to learn what is expected of us in this additional training. The primary object for better results, of course, is the welfare of the patient, but it includes, also, distinct benefits to the medical attendant.

The American Red Cross has already formulated and in some places has already put into practice a plan by which the injured along the highways may receive more prompt and more scientific attention. It involves the establishment of first aid stations, training in first aid to the injured of lay personnel employed near the stations, organization of transportation services, placing of road markers showing where the nearest stations are located, *etc.* Since the automobile and the highway continue to be the battleground where most of the wounded are retrieved, this Red Cross service may become very useful and every medical man should coöperate in the movement.

"Splint them where they lie" was an admonition given by a former generation of surgeons. This is still good advice. The earliest possible splinting of a fracture lessens the intensity of pain and shock and prevents further damage from penetrating bone spicules. Under such circumstances it is very important that suitable

splints are at hand for the purposes already mentioned.

The ability of the first medical man who is called to render first aid and to prepare and transport the fracture patient to a hospital may determine the entire course of the healing process and the functional result of that patient. We recommend that every physician who is at all likely to meet fractures in his practice should learn the art of applying properly the Thomas-Murray and Kelly-Blake hinge splints. The immediate application of traction splints was one of the most useful lessons learned from the World War. It was estimated that this simple procedure saved many thousands of lives. These splints are especially useful because they permit traction on the limb at the same time that the bone fragments are held in a state of fixation. This form of handling fresh fractures may now be considered standardized for our use, and failure to apply both traction and fixation as a primary treatment might readily become of medico-legal importance. The early application of firm traction before the bone fragments have become imbedded in blood clots has often been known to bring about reduction without further manipulation. The opportunity of moving and turning the patient about considerably, while taking the necessary X-ray films, without adding to the pain or causing further damage to soft parts, is of paramount importance to the patient.

Injuries to nerves, tendons and blood vessels must be looked for at the site of every major fracture. If such lesions are found and noted at once, it will help greatly in the later management of the abnormal condition.

There is no necessity of sending a patient with a fractured skull to the hospital with a rush tag on the ambulance or car. On the contrary, undue hurry and rough driving are harmful to the patient, and help to produce a greater shock. If an operation becomes necessary, it will not, as a rule, be done for several hours, or maybe even days. The condition of shock must first be combated and superficial wounds treated. A fractured skull should be handled slowly, deliberately and without rushing. In many cases, a few hours' complete rest may be the best first aid treatment.

Special attention has been given recently to the proper handling of patients with injuries to the spine. The members of the police force in some of our eastern cities have been given special demonstrations on this particular subject, together with other first aid instruction. The spinal column may be fractured in an automobile wreck, for instance, and the force producing the fracture may have stopped before serious compression or laceration of the cord has taken place.

The danger of causing a secondary compression of the cord in such cases through faulty handling of the patient while lifting him off the ground and transporting him to the hospital is very real and not at all uncommon. A number of such injuries have been reported in which the patient was able to move his legs immediately after the accident. However, he promptly became completely paralyzed after he had been lifted off the ground and sent to the hospital in a semi-sitting posture in the back seat of an automobile. Any patient in whom a spinal

fracture is suspected, probable, or even possible, from the nature of the accident, should never have the head and shoulders raised above the horizontal plane. It is easy to visualize the danger to the spinal cord from a "jack-knifing" or bending at the point of fracture and the wedging in of vertebral bone fragments. Such patients must have the shoulder and hip of only one side raised gently and steadily in order to permit a firm stretcher, wide board, a door, or any solid level support, to be passed under the injured back. To place such patients in a half-sitting posture in the back seat of an automobile, or other carriage, is a reprehensible practice. If an ambulance is not immediately available, a truck in which the patient may rest, stretched out horizontally on the improvised back rest, should be the second choice.

The treatment of a traumatized abdomen often taxes all of a surgeon's knowledge, experience and skill. The most frequent intra-abdominal injuries are perforations of viscera. Severe hemorrhages are secondary in importance and may often be combined with the former. When in doubt as to the severity of an injury to the abdomen, it is best to send the patient directly to the hospital where his developing symptoms may be studied and proper treatment instituted quickly, if needed. It should be remembered that a patient with a perforated bowel may be able to walk about for some time after the accident without severe pain. Means should be taken to minimize shock, whenever possible.

Tissues reduced in vitality from any trauma are more readily invaded by pyogenic bacteria than are normal cells. All injured areas, whether the wounds are open or not, must therefore have special attention in order to avoid secondary infections. This calls for aseptic treatment of all wounds, the application of splints and bandages to protect injured soft parts and the early and proper use of massage.

The city administration of Grand Forks should be congratulated on the passage of Health Regulation No. 525, regulating operators of ambulances and the kind of equipment they must carry. Such regulations should be adopted by the larger cities and then, undoubtedly, would soon be accepted by the smaller communities. This, I believe, is a step in the right direction for the care of the injured.

Summary

To summarize, the general principles in first aid care are as follows:

1. Treatment of shock by keeping the patient at rest and warm, or by giving simple stimulants.
2. Control of hemorrhage by pressure or tourniquet, depending on the portion of the body injured.
3. Asepsis in caring for open wounds.
4. Asepsis in the treatment of burns; protection from air if this can be done with aseptic methods.
5. Relief of pain by adequate use of morphine.
6. Immobilization of dislocations and fractures.
7. Transportation by methods that shall not increase the extent of injuries.

Acute Suppurative Mediastinitis*

With Report of a Case Also Showing Pulmonary Abscess

Charles Everard Lyght, M.D.†

Northfield, Minnesota

CLASSED among the more rarely encountered regional inflammations, acute suppurative mediastinitis is usually traceable to: (a) one of the chronic infections such as syphilis, tuberculosis, or osteomyelitis; (b) secondary pyogenic involvement of areas invaded by neoplasms, ulcers, Hodgkin's disease¹, or aneurysms; or (c) trauma with subsequent mediastinal contamination through the punctured thoracic wall, fractured sternum¹⁰ or perforated trachea or esophagus^{11, 12, 13}. In addition to (d) cases traceable to descending involvement from Ludwig's angina, retropharyngeal or peritonsillar abscess, a smaller group (e) has been reported where the inflammatory process seemed to arise from an acute infection of the respiratory system, such as tracheobronchitis, influenza, pneumonia, or pulmonary abscess^{3, 5, 6, 11, 12}.

The lymphatics draining the affected areas convey the infective agents to the adjacent tracheobronchial lymph nodes. After a varying period of time, these glands may undergo necrosis and allow pyogenic invasion of the surrounding mediastinal structures. Occasionally, an abscess, so produced, ruptures into the trachea or bronchus, into the lung or pleural space, or into the esophagus. Other instances are reported of rupture into the pericardial sac, or of erosion of the walls of the great vessels. Less frequently, the purulent collection discharges through one of the intercostal spaces¹⁰. In children, measles and whooping cough seem to have been very occasionally responsible for mediastinal abscess formation⁴.

Acute mediastinitis of the suppurative type seems to affect males more often than females, if the limited number of cases in the literature can be accepted as a reliable criterion. Adults are more frequently affected than children. In fact, among infants and young children, the occurrence of mediastinitis seems predominantly due to erosion of the trachea or esophagus following the lodgement of foreign bodies in these sites. Even so, the total number of cases in the young is relatively small^{2, 8}.

As regards the portion of the mediastinum invaded, Lloyd and Hassett⁷ draw attention to Hare's study of 36 cases, revealing 30 with involvement of the anterior, four of the posterior, and two of the whole mediastinum. In the cases reported by various observers where the lesion has arisen from respiratory tract infection, a significant majority shows involvement of the right superior mediastinum^{4, 5, 6}.

* From the department of student health, University of Wisconsin, Madison, Wisconsin.

† Professor of student health, hygiene, and physical education, Carleton College, Northfield, Minnesota; formerly director, department of student health, University of Wisconsin, Madison, Wisconsin.

That the occurrence of the condition may be considered quite rare is borne out by the following statistics, as well as by the paucity of case reports in the literature. Since the opening of the State of Wisconsin General Hospital, Madison, in 1924, only five cases of proved acute suppurative mediastinitis have been observed among 91,000 patients, while over the corresponding 12-year period, 24,000 admissions to the University of Wisconsin Student Infirmary have yielded no cases whatsoever among students. (Case 5, the one here reported, occurred in a non-student patient.)

Of the five cases mentioned, four prior to the one here to be reported have been summarized as follows:

1. Male, aged 56, had dysphagia for three months prior to admission. The diagnosis was cardiospasm. A barium meal and passage of a bougie was followed by epigastric pain and signs of probable peritonitis. Laparotomy showed free barium in the abdominal cavity. Bilateral bronchopneumonia and an acute mediastinitis developed, and death occurred on the third day after admission to hospital. Autopsy confirmed the presence of a perforated esophagus and a mediastinal abscess.

2. Female, aged 64, had dysphagia, nausea and vomiting for seven years prior to admission. X-ray revealed cardiospasm and esophageal dilatation. Attempts to dilate the constricted portion, first by a metal olive and later by mild hydrostatic methods, were succeeded by intense pain, choking, and dyspnea. Death supervened within 50 hours. After her death, the patient's family volunteered the further information that 12 years previously she had swallowed a quantity of phenol, with some gradually increasing dysphagia thereafter. Autopsy disclosed an inflamed and edematous posterior mediastinum, with early abscess present.

3. Female, aged 42, was admitted for surgical removal of a thyroid adenoma. Three days postoperatively she developed stridor, dyspnea and cyanosis, making tracheotomy necessary. Bronchopneumonia and mediastinitis occurred, with death on the ninth day following operation. Autopsy verified the presence of a walled-off, superior mediastinal abscess on the left, displacing the trachea to the right.

4. Male, aged 17, deaf-mute, was sent to hospital because of daily afternoon temperature to 101° F. following sore-throat of six weeks duration, right sided cervical lymphadenopathy for four weeks, and pain in right lower chest three weeks prior to admission. A dry, non-productive cough had been present. History further complicated by the patient's claim of having swallowed a toothpick at a recent but indefinite date, without, however, any immediate discomfort. Roentgenograms

CHART I.

Date	Symptoms	Signs	Laboratory Findings
4.13.36 (Adm.)	As above	As above.	As above.
4.14.36	Severe headache; no nausea; dry cough continues in paroxysms.	Right chest findings unchanged; no râles. Heart less overactive; 3rd sound at apex. Right pectorals and trapezius sore to touch; pain substernally on pressure.	W. B. C. 27,400. Poly's. 91%
4.15.36	Unchanged	Unchanged.	W. B. C. 20,500. Poly's. 90% X-ray: No pneumonia.
4.16.36	Profuse diaphoresis; hyperesthesia of right side chest, neck and scalp; cough continues; less headache.	No evidence of consolidation; pneumonia, if present, judged to be centrally located.	W. B. C. 16,050. Poly's. 89%
4.17.36	More pain in chest and neck, especially when coughing.	Vague right sided chest signs as before; no râles.	W. B. C. 19,800. Poly's. 87% Blood cultures: No growth up to 7 days. Agglutination tests: All negative.
4.18.36	Coughing paroxysms less frequent, still painful.	Percussion note and breath sounds over right chest both improved. D'Esoine's sign positive. Septic type of temperature.	W. B. C. 26,800. Poly's. 88% X-ray: widening of superior mediastinum to right. Sputum negative pneumococci; neg. TB.; gram stain showed large gram pos. pleomorphic bacilli, small gram pos. bacilli, streptococci, and gram neg. diplococci.
4.19.36	Most comfortable when flat on back; lying on side causes increased pain, slight dyspnea; there is some dysphagia. (Oxygen therapy begun 4.20.36).	Harsher breath sounds on right; no râles. Patient sicker: Temp. 102.2° F., pulse 112, respirations 30. Impression: right superior mediastinitis, acute, probably suppurative.	W. B. C. 25,800. Poly's. 86% W. B. C. 30,350. Poly's. 87% X-ray: Rapidly increasing density in right superior mediastinum as shown by A-P and lateral views. Beginning to involve medial portion of right upper lobe.
4.21.36 A. M.	Subjectively improved by oxygen therapy.	Temp. 100.6° F. Pulse 84, Resp. 24; color good; heart action less labored; P ₂ strongly accentuated; no vascular engorgement observed; signs over right upper chest becoming definite, with more limited excursion, increased tactile fremitus, vocal resonance, and whispered voice, prolonged expiratory phase, occasional bronchial squeaks, marked impairment to percussion along right sternal border.	W. B. C. 30,900 Poly's. 86%
4.21.36 Noon	Foul sputum in considerable quantities being coughed up.	Bronchoscopic examination showed copious purulent drainage from right main bronchus, no actual fistula observed, this being probably well superior to the area of possible visualization.	Pus—Streptococci predominate, micro. catarrhalis present.
4.22.36	Had a better night, felt better. Profuse expectoration of foul, bad tasting sputum, blood streaked at times.	Temp. 98° F., Pulse 90, Resp. 24: chest findings unchanged; no râles, even after coughing.	W. B. C. 29,750. Poly's. 90%
4.23.36	More comfortable.	Inconstant pleural friction rub at right anterior axillary line.	W. B. C. 27,850. Poly's. 88%
4.24.36	Improvement continues; less cough and less sputum; pleural pain on coughing.	No râles; no rub; breath sounds less harsh.	W. B. C. 17,000. Poly's. 89% X-ray: density more sharply demarcated in right upper lobe, medial half, with suggestion of cavity formation.
4.27.36 A. M.	Slow improvement; cough and production of blood-tinged foul sputum gradually decreasing.	No râles; impairment of percussion note the most noticeable sign.	W. B. C. 20,500. Poly's. 84%
4.27.36 P. M.	Sicker late in day, until adequate drainage was suddenly resumed; cough quite distressing.	Temperature 103.4°.	Pus—steadily negative to TB by stain, culture, and guinea pig inoculation; negative fungus; flora as before.
4.30.36	Steady improvement	Slow subsidence of increased vibratory phenomena; no râles.	Hb. 75%. R. B. C. 4,820,000. W. B. C. 14,450. Poly's. 82%. X-ray: density about same. Central rarefaction definite.
5.5.36	Much improved; cough less frequent and painful; sputum greenish, not so foul, very little blood.	Practically afebrile; moderate number, coarse râles in right interscapular area, 2nd to 5th ribs.	W. B. C. 13,200. Poly's. 84%
5.7.36	Practically no sputum.	Physical signs steadily less marked.	W. B. C. 9,750. Poly's. 66%. Sputum: Continues neg. to TB. Sedimentation rate: 27 mm. in 1 hr. (Cutler).
5.9-23.36	Unchanged		X-ray: gradual resorption of inflammatory reaction about abscess cavity; latter measures about 2x1.5 cm. (flat film). W. B. C. 7,200 to 9,350; Poly's. 71% to 61%; Sed. Rate (5.14.36): 15 mm. in 1 hr. (Cutler). X-ray: steady improvement.
5.24.36	Flare-up of fever, cough and purulent expectoration, with immediately following improvement.	Cavity located at level of 4th rib posteriorly and 1st rib anteriorly.	W. B. C. 11,200. Poly's. 79% X-ray: cavity measures 3x2.5 cm. (flat film).
6.4.36	Practically symptomless	Minimal.	W. B. C. 8,900. Poly's. 75% X-ray: Cavity size of small hen's egg (stereoscopic film). Surrounding reaction has largely disappeared. Sed. rate: 9 mm. in 1 hr. (Cutler).

6.12.36	Allowed up in chair		W. B. C. 7,050. Poly's. 65% X-ray: further clearing, but cavity no smaller.
6.24.36	To operating room for temporary right phrenic block.		Hb. 80%. R. B. C. 5,180,000.
6.25.36	Some pain in upper distribution of right phrenic nerve.		
6.26.36	Comfortable	Diaphragmatic excursion (to percussion): Left is normal. Right lies 2.5 cm. above left, moves little.	X-ray: confirms position of diaphragms; slight pleural haze over right apex; cavity about same size.
6.29.36	Comfortable; conscious of mild restriction of movement in right chest. Up and about.	Diaphragmatic excursion (fluoroscopic): Left, 6:75 cm. Right lies 3.5 cm. higher than left, moves 2.5 cm.	Hb. 82%. R. B. C. 5,510,000. W. B. C. 7,000. Poly's. 72%.
7.1.36	Discharged.		

showed a right superior mediastinal density with a definite fluid level. The impression was that of mediastinal abscess. Progressive improvement in symptoms, physical signs, and X-ray findings occurred following a dramatic drop in temperature within 36 hours after entrance, though no pus was ever shown to have been vomited or coughed up. Esophagoscopy showed nothing abnormal, though the possibility does exist that the pus may have been evacuated into the esophagus and swallowed.

This last patient, of the four above, stands alone in bearing etiologically any resemblance to the case now to be reported. Even in this instance, however, the possibility of a foreign body having caused the initial trauma cannot be successfully excluded. Incidentally, like the present case, patient number four made a spontaneous recovery, whereas the other three cases all terminated fatally.

Case History

L. R. C., a white, male physician, aged 34, was admitted to the University of Wisconsin Student Infirmary on April 13, 1936, with the chief complaint of severe headache and general muscular aching.

History of Present Illness: For almost three months prior to admission to hospital the patient had been experiencing a dry, hacking cough, worse at night, and refusing to respond to all ordinary therapy. Repeated physical examinations of the chest had been negative, and fluoroscopic examination confirmed by an X-ray film had shown nothing abnormal in lungs, heart, great vessels, or mediastinum to account for the persistent symptoms.

Two days prior to admission to the infirmary there had developed generalized aching, moderate headache and some slight eyeball soreness. The patient went to bed and treated himself as a case of la grippe. He felt no better the following day, and during that night developed chills, increased fever, profuse diaphoresis, and a much more intense frontal headache. The cough was very distressing; there was pain in the right shoulder, neck and chest increased by respiratory or voluntary movements; mild abdominal distention, anorexia, nausea and vomiting.

On the morning of April 13, the patient was examined at home, where the only positive findings were a fever of 103.4° F., pulse 108, respirations 26, suppressed breath sounds in right axilla accompanied by minimal impairment of percussion note over the upper half of

the slightly lagging right chest. A tentative diagnosis of early right-sided bronchopneumonia, probably influenzal in type, was made, and the patient admitted to the infirmary.

Past Medical History: Childhood: measles, mumps, whooping cough, all mild and uncomplicated. Youth: scarlet fever, severe, followed by chronic valvular endocarditis, as shown by physical examination and repeated orthodiascopic studies. Adult life: spontaneous subarachnoid hemorrhage, 1932, with full recovery. Seasonal (ragweed) pollinosis, under adequate treatment.

Social History: Irrelevant, except for constant exposure to acute respiratory infections through duties as a physician in the Student Health Service.

Physical Examination: A thin, rather poorly nourished but well developed white male of 34 years, quite coöperative and well above the average in intelligence, lying quietly in bed, but with slightly accelerated respiratory rate, and obviously very uncomfortable. Temperature 103.8° F., pulse 112, respirations 24. The positive physical findings included: Warm, dry skin; eyeball tenderness; injection of nasal and nasopharyngeal membranes; anterior cervical glands palpably enlarged but not tender; slight gaseous abdominal distention. The chest showed slightly decreased expansion on the right, accompanied over the right upper lobe by distant and jerky breath sounds, a mild impairment of percussion note, and slight accentuation of whispered and spoken voice sounds. There were no râles. The heart rate was rapid, 112 or over at all times, pulse of good quality, blood pressure 124/70. The transverse diameter of the heart was enlarged, the apex well outside the mid-clavicular line. A soft, blowing, systolic murmur, audible at the apex, was transmitted laterally to the mid-axilla. The pulmonic and aortic second sounds were approximately equal in intensity.

The impressions at that time were: (1) influenza, with acute rhinopharyngitis, right-sided bronchopneumonia, right-sided diaphragmatic pleurisy; (2) chronic rheumatic heart disease, with moderate cardiac hypertrophy, mitral insufficiency, functionally Grade I.

Although a pneumonic process seemed the most tenable diagnosis, yet, because of the pre-existing rheumatic heart lesion and the relatively recent vascular disaster, the possibility of a lighting-up of the cardiac pathology had to be kept in mind, especially in the presence of intractable chronic cough, pallor, fatigue, and substernal

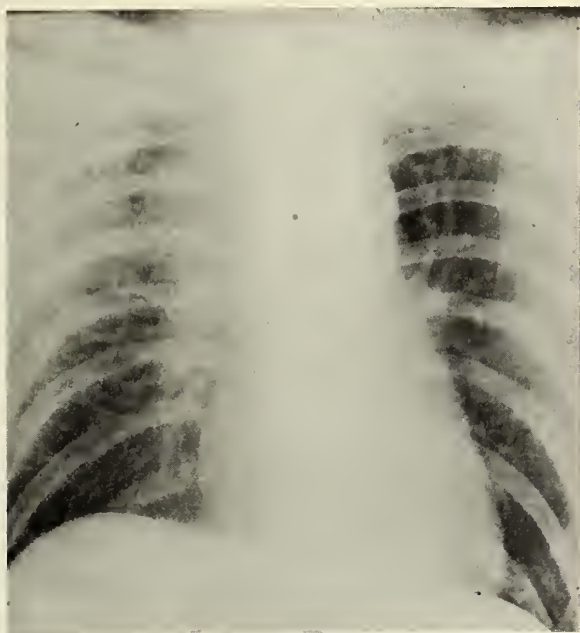


Figure 1

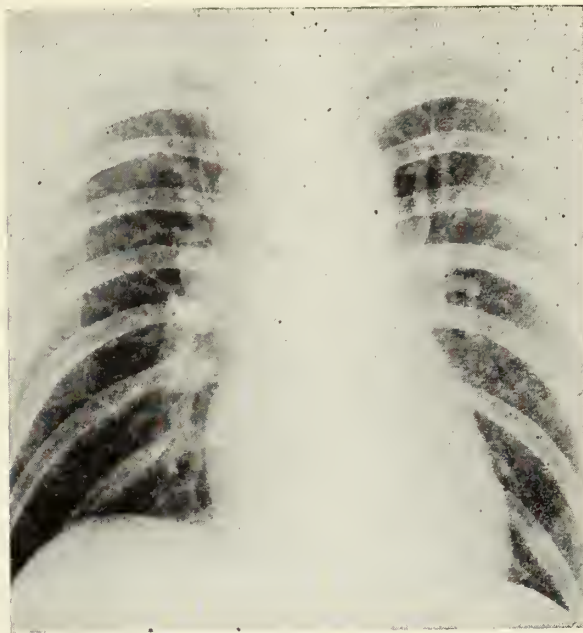


Figure 2



Figure 3

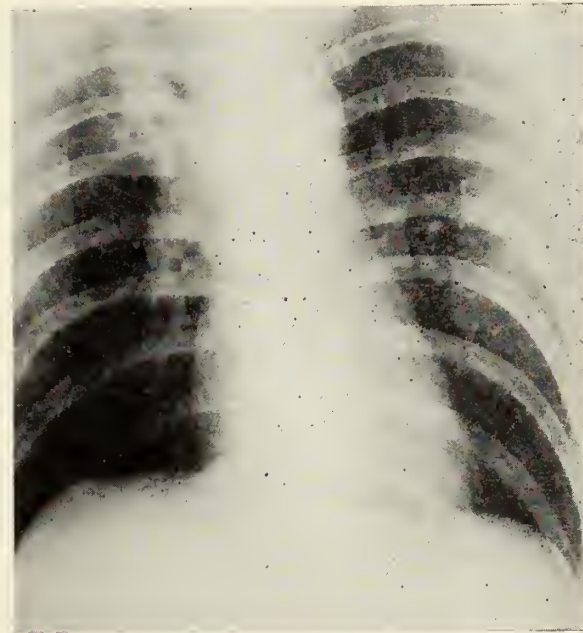


Figure 4

with excellent result. The laboratory findings, as given, are those that might be predicted from the clinical picture. No evidence of active pulmonary tuberculosis was ever found, by direct sputum examination, cultures, or guinea pig inoculation. The causal organism was most likely the predominant streptococcus found in all sputum specimens, though a very mixed group of micro-organisms with even a very occasional spirochete was reported.

Roentgenographic studies made in January, 1937, finally revealed complete closure of the cavity. The patient is in excellent health.

Comment

This case rather closely resembles one in a student nurse reported by Farnum¹², and one in a patient convalescing from pneumonia, recorded by Lloyd⁵. All three proceeded to spontaneous evacuation of their ab-



Figure 5



Figure 6

scases *via* the bronchi or trachea. Similar cases are scarce in the literature, probably because the condition seems truly infrequent in occurrence. The clinical recognition of acute suppurative mediastinitis in its early stages is remarked by most writers as unusual. Occurrence of a chronic non-productive cough, substernal pain, or thoracic visceral pressure effects, especially following an acute respiratory infection, and accompanied by a septic temperature, chills, and polymorphonuclear leukocytosis, should arouse suspicion as to its presence, just as would such symptoms if observed in patients acknowledged to have had more immediate local reason (*e. g.*, foreign body) for development of mediastinal inflammation. While physical signs may be lacking for a considerable period of time, and may never exceed moderate impairment of percussion note, the roentgenogram should disclose rather early the increase in the mediastinal shadow. It is the prime diagnostic method in these cases.

The therapy is largely symptomatic and supportive, though surgery may have to be enlisted where nature is not as kind as in the case here described. Trephining of the sternum, or resection of overlying ribs is the usually recommended procedure in cases of anteriorly placed abscesses. Malnekoff⁴ reported a case in an infant treated successfully by repeated aspirations of pus through a needle inserted close to the sternum. Salazar de Sousa⁶ added to this procedure the injection of nearsphenamine into the abscess cavity, though his case eventually came to operation. Butler⁹ also reported the employment of nearsphenamine in local application to

a mediastinal abscess cavity where spirochetes were identified as the causal organism, with spectacular results.

The prognosis is always grave in cases of acute supuration in the mediastinum, but not hopeless. Early recognition, followed by judicious selection of the optimum time and avenue for surgical drainage, would seem to promise the greatest chance of recovery to those cases where the abscess is so situated that anatomically the patient has not been doomed from the beginning.

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When Surgery Is Indicated In Pulmonary Tuberculosis*

Thos. J. Kinsella, M.D.†

Minneapolis, Minnesota

THIS TITLE, as originally suggested by Dr. Coslett, readily lends itself to a consideration of the subject matter in two distinct divisions, both of which are of vital importance to the safety of the tuberculous patient for whom surgery is necessary. First of all, we may consider, "when is surgery indicated in the patient with pulmonary tuberculosis" for pulmonary and extrapulmonary foci of either tuberculous or non-tuberculous disease, and secondly, if surgery is indicated and has been decided upon, how shall we handle the problem so as to afford the patient the least possible risk to his life or future health? Separate consideration will be given to both phases of the subject which, however, must be well correlated if best results are to be obtained.

When Is Surgery Indicated in Pulmonary Tuberculosis?

The patient suffering from pulmonary tuberculosis may require surgical intervention, either to aid him in controlling his pulmonary lesion, or to relieve him of some extra-thoracic process which is threatening his life, interfering with his comfort, or impeding his efforts to control his pulmonary infection. For the purposes of this consideration, surgical procedures may be divided into emergency and elective operations. Emergency operations for tuberculous pulmonary disease are relatively rare, but occasionally, emergencies arise which demand immediate treatment if the patient is to be saved. The institution of artificial pneumothorax or the interruption of a phrenic nerve for the control of profuse or repeated pulmonary hemorrhage, the aspiration of air to relieve the pressure of a tension pneumothorax, or the aspiration of a massive pleural or pericardial effusion, constitute emergency surgical procedures which, while relatively simple in themselves, may nevertheless be life-saving in effect. Emergency surgical interference for conditions outside of the chest will probably be indicated more frequently, and may be equally as important to the patient. The removal of an acutely inflamed appendix, the relieving of a strangulated hernia or an intestinal obstruction, the closure of a perforated viscus, the drainage of a pelvic or perinephritic abscess, or the reduction and fixation of a fracture, constitute emergencies which must be treated in spite of active pulmonary tuberculosis if the patient is to survive or avoid more serious complications; yet they should be handled in such a way as to jeopardize to the least degree the patient's chances of recovery from his pulmonary disease. Certain points to be considered in order thus to safeguard the patient during such procedures

will be considered later. We cannot endorse the feeling, once so common among physicians doing tuberculosis work, that tuberculous individuals should not be subjected to surgery, for this attitude unnecessarily denies to many a patient his right to live.

An emergency surgical operation properly performed with due consideration of an active tuberculous lesion may prove of great benefit to the tuberculous individual, rather than a detriment to him. We cannot justify the attitude of some surgeons, who brazenly proceed with surgical operations which are of a purely elective nature without any consideration of an active pulmonary tuberculosis, and attempt to justify such interference by the statement that nothing happened during the patient's two weeks residence in the hospital, or that they hoped, by relieving the patient of one focus, to enable him better to control his pulmonary disease. Pulmonary tuberculosis is potentially far more dangerous to life than any other tuberculous focus and should, therefore, be given prime consideration whenever surgery is indicated. The selection of the proper time for the performance of elective surgery in the patient with pulmonary tuberculosis is at times a difficult problem, and one which calls for the exercise of rare judgment in which the phthisiologist, the internist and surgeon must carefully weigh all angles before making the decision. The patient's whole future may be determined by the care with which this decision is made, for it avails nothing to treat successfully an extrapulmonary focus, and then have the patient succumb to his original pulmonary disease.

Effective Surgical Procedures for Pulmonary Disease

Pulmonary tuberculosis is a chronic disease whose course is frequently marked by exacerbations and remissions, but whose general tendency under unfavorable conditions is toward progression. Under favorable conditions, its progress may not only be stopped, but not infrequently may be reversed to a degree which permits recovery. Years of experience in treating tuberculosis has amply demonstrated that the conditions most favorable for the healing of a tuberculous lesion are those which most closely approach absolute physiological rest for the involved tissue or organ. The disease, however, is a constitutional one, and any system of treatment which treats only the local lesion and not the patient as a whole falls short of giving the individual his best possible chance of recovery. While it is possible in certain extra-pulmonary tuberculous foci, such as in knee, elbow or hip, by proper methods to obtain almost a complete ablation of all physiological function, this is impossible in diseases of the respiratory system, for the patient must continue to breathe if he is to survive. It

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† Departments of Surgery of Glen Lake Sanatorium, Minneapolis General Hospital, University of Minnesota.

‡ Assistant professor of surgery, University of Minnesota.

is possible, however, to obtain marked reduction of this function, and excellent results have been obtained by the intensive use of such measures, in spite of the fact that they fall somewhat short of the ideal described above. The closest approach to ideal conditions by medical management of both the patient and the local lesion is provided by the prolonged intensive bed-rest available in the well-equipped modern sanatorium for the intensive hygienic, dietary and disciplinary control of the patient suffering from pulmonary tuberculosis. Under such a regimen, patients suffering from minimal or uncomplicated moderately-advanced pulmonary tuberculosis should have more than a 90 per cent chance of making a good recovery. The same program may be carried out in the local hospital or the home, but almost invariably at some sacrifice of efficiency of the treatment, the amount depending upon the conscientiousness of the patient, and the perseverance with which the required discipline is maintained.

Complete recovery in individuals with more extensive disease is impeded or prevented by the massive extent of the disease itself, by the occurrence of some intercurrent complication such as pulmonary hemorrhage, or the development of intrapulmonary cavitation, or, more rarely, by pyothorax or pyopneumothorax. It is in an attempt to correct or relieve the patient of these complications that our surgical efforts are directed. It must be understood from the outset that surgical operations do not cure pulmonary tuberculosis; that they do not remove one bit of tuberculosis from the patient's body; but that they merely act directly in a mechanical way to control bleeding, to close intrapulmonary cavitation or obliterate the pleural cavity and indirectly to supplement our constitutional measures by immobilizing and reducing the capacity of the lung, and by altering the respiratory, circulatory and lymphatic systems in such a way that healing occurs more readily. They are valuable adjuncts to our constitutional treatment; but not the most important part thereof. Their use, without at the same time treating the patient for his tuberculosis by constitutional means, demonstrates either a woeful lack of appreciation of the fundamental principles involved in the treatment of this disease, or a willingness to gamble on obtaining a good result by half-way measures with the patient assuming all of the risk. No patient suffering from pulmonary tuberculosis has any chances to throw away, and it is folly, with the facilities available at the present time, to do anything but take advantage of every possible means to render the patient's recovery more certain.

When Is Collapse Therapy Indicated

The patient suffering from active pulmonary tuberculosis should be placed in bed, and carefully studied from head to foot in order to determine the extent of disease, its complications, what other organs if any are involved and to what degree—in other words, studied so that we may know everything possible about the patient and his disease, and the handicaps which may confront him. It is only by this method that an in-

telligent program of treatment can be undertaken. We must treat the patient, and not merely his local disease. Physical examination of the chest alone is not sufficient, for it does not give us all of the information needed concerning even the lungs themselves. Stereoscopic X-ray films of the lungs, properly made and interpreted, reveal many things concerning the extent, type of disease and complications altogether unsuspected from physical examination alone.

If the disease be minimal or early moderately-advanced, without pulmonary hemorrhage or demonstrable cavitation, constitutional treatment alone may prove sufficient. The patient should be placed on an intensive constitutional régime for a period of six to eight weeks, at the end of which the situation should again be reviewed with the help of additional physical examination and X-ray films of the chest. If improvement has occurred, and all evidence indicates that everything is progressing favorably, this program should be continued until the desired result is obtained and the patient has cleared up as much tuberculosis as possible. If any extension of the disease is now demonstrated or cavitation or other complications have developed, collapse of some type should be undertaken without delay. Should the original examinations reveal somewhat more extensive disease with small cavity or more marked symptoms and yet disease which is not too advanced, a similar program may be followed, particularly if the patient, prior to the time his tuberculosis was discovered, had been undergoing marked strain or exertion, so that the change from his original program to the sanatorium régime constitutes a marked retrenchment. Constitutional treatment alone, in some such individuals, may provide an adequate answer for the whole problem. If, however, at the end of this observation period, the patient has not demonstrated definite signs of improvement in symptoms, either toxic or local, or elimination of the cavity, or if the secondary review of the situation reveals any tendency toward progression or the development of more cavitation, collapse therapy of some type should be undertaken without further delay.

If the patient, upon the original examination, presents more extensive tuberculosis or evidence of extrapulmonary tuberculosis, particularly involvement of the larynx or intestinal tract, or the presence of more than small cavitation, we feel that collapse therapy by one of the simpler methods should be attempted without delay and without the preliminary period of observation. The general tendency throughout the country in the past few years has been to establish collapse earlier and on slighter indications than several years ago, although it may be said truthfully that at times this has been carried to an absurd extreme by those who have forgotten or never learned that even fairly extensive tuberculosis may not infrequently be controlled within a reasonable time under conservative measures alone. The earlier institution of collapse therapy, particularly in the presence of persistently positive sputum, has been followed by a striking reduction in the incidence of tuberculous complications in the larynx and intestinal tract, and has un-

doubtedly increased the incidence of recovery from extensive tuberculous disease. It should go without saying that the simplest type of collapse adequate to meet the situation should be the one chosen in each particular instance. We still see considerable lack of judgment evidenced in the selection of the proper method in some individuals, varying from the use of extremely radical methods for relatively simple lesions to the equally absurd extreme of pinning one's faith upon simple procedure in the face of very extensive disease capable of being controlled with difficulty by the most radical form of collapse.

Types of Collapse Available

Collapse therapy measures available for the treatment of pulmonary tuberculosis may be roughly divided into two classes: (1) the group of procedures which are directed against the lung itself, and (2) the series of procedures in which the lung itself is secondarily affected through operations directed against the respiratory mechanism. The first group includes the procedures of artificial pneumothorax, intrapleural pneumonolysis (adhesion cutting within a pneumothorax cavity), and extrapleural pneumonolysis with plobe (paraffin pack). The second group of procedures directed against the respiratory mechanism include: (1) operation upon the phrenic nerve (phrenicpraxis, phrenicectomy, phrenic exeresis), (2) intercostal neurectomy (section of the intercostal nerves), (3) scalenotomy (section of the scalene muscles), and (4) extrapleural thoracoplasty. As adequate consideration of even one of these procedures would provide ample material for a book, we must here be content with a very brief consideration, and a statement of our evaluation of them, rather than a detailed discussion thereof.

Artificial Pneumothorax

Artificial pneumothorax is the simplest and safest, yet withal the most valuable type of collapse therapy, and should be given first consideration whenever collapse is indicated. Its success depends upon the absence of adhesions between the visceral and parietal pleura over the site of the tuberculosis, particularly the cavity, and our ability to establish and maintain adequate collapse of this portion of the lung. Within limits it may be increased and decreased at will by the operator, and is capable of giving the most complete collapse of the lung possible by any method or combination of methods. It may be used as a temporary procedure, and discontinued when it has served its purpose, allowing the lung to expand after the lesion has become healed. Because of its flexibility and controllability it may, if carefully handled, be used as a bilateral procedure with a considerable margin of safety. When intelligently used and properly controlled (fluoroscopic, X-ray, physical examination frequently), it is capable of producing miraculous change in the condition of the patient under treatment. It will double or treble a given patient's chances of recovery over what he has to expect without it. The occurrence of complications, accidental pneumothorax

(frequent, early), spontaneous pneumothorax (occasional), air embolism (one in 10,000 injections), pleural effusion (60 to 80 per cent) and tuberculous pyopneumothorax (eight to ten per cent), and the necessity for continuing it for a long period of time detract from its value but still leave it as the first-ranking type of collapse therapy.

Intrapleural Pneumonolysis

Complete obliteration of the pleural cavity renders the establishment of a pneumothorax impossible. Localized obliteration of the pleural cavity, particularly about the area of tuberculous pulmonary disease, may render the collapse inadequate or prevent closure of the cavity. Localized adhesions of the string, cord, thin band or membranous type, and occasional cone-shaped attachment of the lung to the parietal pleura may be successfully sectioned or detached by the operation of intrapleural pneumonolysis (adhesion cutting), performed either according to the open or closed method. The open method in which the pleural cavity is opened through an intercostal incision, and the adhesions ligated and sectioned under direct vision, is a major procedure entailing more risk but occasionally offering control of situations which could not be met otherwise. The closed method in which the adhesions are visualized through a telescope, and sectioned and detached either by the use of galvano-cautery or the endotherm is somewhat more complicated technically, but carries with it less risk and is entirely adequate for most situations where the procedure is indicated. Either procedure, if successful, enables the operator to convert an otherwise unsatisfactory pneumothorax into a satisfactory pneumothorax without adhesions. The complications of hemorrhage, spontaneous pneumothorax, hydro- and pyo-pneumothorax increase in frequency as the more and more complicated and consequently more difficult cases are undertaken. The procedure is a valuable one which has, however, at times been overemphasized by certain enthusiasts.

Extrapleural Pneumonolysis

When the pleural cavity is completely obliterated by adhesions, such as follow extensive pleural effusion, and it has been found impossible to establish pneumothorax, another type of operation called extrapleural pneumonolysis may at times be used to advantage. This procedure, once used, later abandoned and since revived, consists in the resection of a portion of one rib posteriorly, the stripping of the parietal pleura from the inside of the chest wall over the area occupied by the tuberculous lesion, and the filling of the space thus established by some type of plastic material (most frequently paraffin or some combination thereof) in order to maintain permanently the collapse obtained. By avoiding those conditions which in the history of the procedure led to complications, and limiting its use to patients presenting smaller cavities (under five cm.) not peripherally situated, and no free pleural space, it has been possible to avoid such complications as perforation, extrusion, infection and migration which previously brought the pro-

cedure into disrepute. When properly used, in carefully selected patients, in amounts which were not too large (200 to 450 grams) it can give us adequate collapse of local lesions in one operation, without deformity save for the scar, and with less reduction of breathing capacity than would accompany a thoracoplasty giving the same amount of collapse. It has proven particularly useful in patients with limited vital capacity, in poor risk patients, and those in whom some type of bilateral collapse is necessary. To date, in 35 operations on 32 patients in our experience, there has been no mortality; and the majority have obtained the results desired. In three instances, it has been necessary to perform thoracoplasty over the pack because of a recurrence of positive sputum, but in none of these has the pack been removed. Our past experience justifies its continued use.

Surgery Upon the Phrenic Nerve

Phrenic nerve interruption, temporary or permanent, has been used widely, if not always too wisely, in the treatment of this disease since its introduction in 1911. Because of the apparent simplicity of the procedure, the publication of numerous over-enthusiastic reports and the occasional occurrence of almost miraculous results following its induction, thousands of operations of this type have been performed on tuberculous individuals without adequate consideration being given to the mechanism of its action, the probability of its producing the desired results and especially to the possible complications which might later be encountered as the result of its indiscriminate use. This, in turn, has brought about a reaction to the opposite extreme, with some men discarding it completely, and denying any possible benefit which might follow its use. Neither extreme is justifiable. It has its uses, but likewise its limitations. It produces a limited reduction in chest capacity (not over 30 per cent at the most), and a relative immobilization only, but it does not prevent aspiration of sputum from apex to base. It may impede rather than facilitate expectoration. It may not be simple, and it may not be harmless. The great difficulty has been not so much in the procedure itself as in the judgment with which it was used. It is as illogical to expect paralysis of the diaphragm alone to take adequate care of extensive tuberculosis with cavitation as it is to treat minimal pulmonary tuberculosis by thoracoplasty or asymptomatic X-ray shadows by pneumothorax. It may be of value in certain earlier lesions or in combination with pneumothorax, where the lung is adherent to the central portion of the diaphragm, and occasionally as a preliminary preparatory measure for thoracoplasty (exudative disease or contralateral activity). Also, it may be of value as a supplementary procedure to complete thoracoplasty. As an emergency measure for control of hemorrhage, it may also be valuable. Occasionally, miracles are wrought, but rarely in extensive pulmonary disease is it satisfactory as a sole therapeutic measure. Permanent interruption (phrenic exeresis or phrenicectomy) should rarely be performed as a primary procedure, but

may at times be utilized secondarily. Temporary interruption by crushing (phreniphaxis) should be the method used as a primary operation, repeated as necessary subsequently. The wisdom of its use as a bilateral procedure, in any form but temporary, is open to serious doubt.

Extrapleural Thoracoplasty

Extrapleural thoracoplasty represents a rather radical answer to what otherwise might prove a very unfavorable situation in the life of a patient suffering from pulmonary tuberculosis. Its use provides collapse and immobilization of the lung in patients in whom the procedures mentioned above have been either impossible or inadequate. By this method, the rigid bony framework of the chest is removed to permit the underlying lung to collapse and retract in an attempt to control the extensive underlying disease. Originally, thoracoplasty was used more or less as a last resort in an attempt to avert what might otherwise be a fatal outcome. In spite of the unfavorable circumstances under which many of these operations were undertaken, many surprisingly good results have been obtained. As a result of this experience, the attitude of the profession is changing somewhat, with the result that now the procedure is being recommended much earlier in the course of the disease, before the patient's resources are exhausted and when the chances of successful rehabilitation following a satisfactory operation are infinitely better. This change of policy, together with increased experience in handling patients of this type, has resulted in a lower mortality and higher percentage of good results.

The chief indications for which thoracoplasty operations are performed include pulmonary cavitation, most frequently, extensive unilateral disease, profuse or repeated pulmonary hemorrhage and tuberculous pyopneumothorax or pyothorax with or without secondary infection. The presence of intrapulmonary cavitation, either large or small, probably constitutes the chief indication for this type of interference, and the success of the operative procedure may be pretty well gauged by our ability to bring about closure of the offending cavity. If the cavity be small and relatively soft-walled, partial thoracoplasty even of a limited type may prove adequate. If the cavity is very large, and there is little or no lung tissue left in the upper portion of the chest, or if the overlying pleura or the cavity wall is extremely rigid, even complete removal of all ribs combined with a number of accessory procedures may prove insufficient and the cavity becomes reduced in size but not completely closed. This constitutes another argument for the application of collapse therapy early, if the patient can be discovered and treated at this time. The use of partial thoracoplasty in circumstances where it has a legitimate chance of proving successful is to be commended as the additional breathing space spared in the lower portion of the chest adds to the patient's eventual vital capacity and thereby, if the result is successful, to his working capacity.

The extent of the thoracoplasty to be performed in a given individual should be determined in each particular instance by the extent and character of the disease, the size of the cavity, as well as the patient's ability to withstand surgery rather than by any rule of thumb or routine procedure. Small lesions at times may require rather extensive surgery whereas, paradoxically, large cavities may occasionally disappear following rather limited rib resection. The amount of surgery to be performed, like the proper dose of morphine for the control of pain, should be enough to accomplish the desired result. If partial thoracoplasties are to be used frequently, the surgeon may find it advisable, if the scapula be long, to resect the lower angle in order to permit the shoulder blade to fall forward and facilitate subsequent arm motion.

Years of experience have demonstrated the wisdom and the safety of performing thoracoplasty in stages, the number and sequence of which should be determined by the character and extent of the lesion, the patient's condition and ability to withstand surgery, his reaction to trauma while undergoing the operation, the flexibility of the chest wall and mediastinum, the amount of blood lost, *etc.*, rather than by any previous plan or technic. As the surgeon can judge some of these points only as the operation proceeds, he must be willing to adapt himself to changing circumstances as they arise. It is infinitely better to have a living patient who will require further surgery than a dead patient upon whom a beautiful operation has been performed. The surgeon should at all times have the patient's interests rather than his own inclinations at heart.

The question of local or general anesthesia for thoracoplasty, again, must be determined by the patient's condition, and to a lesser degree, by the surgeon's preference. There can be no question but that in many patients the choice of anesthetic, if properly given, does not make a great deal of difference. The sicker the patient or the poorer his condition, the greater the volume of his sputum, the lower his respiratory reserve, whether it be diminished by disease or contralateral collapse, the greater the indication for the use of local anesthesia, if the surgeon be skilled in its use. Should the surgeon be technically unskilled or temperamentally unfitted for the use of local anesthesia, it would be unwise for him and unfortunate for the poor risk patient that such an anesthetic should be used. Under local anesthesia, the time consumed in performing the operation becomes of less importance. Under any anesthetic a race to complete the operation in record time benefits the patient little, if any.

The sequence of operations has varied widely in our experience. Usually the upper posterior three or four ribs have been removed first, an anterolateral resection of the remaining segments of these ribs and cartilages being performed as a second or third stage if necessary and the others in whatever sequence seems advisable. The procedure and sequence has been gauged entirely by the indications and the patient's reaction. Zenker's

fluid, or formaldehyde, applied to the periosteal bed for four or five centimeters posteriorly in the region of the angle of the rib, has been used in all stage operations and apparently has resulted in reduced regeneration of rib in this area. When the costal cartilages have been removed in front, the perichondrium has always been carefully-preserved, and no difficulty has been encountered subsequently in obtaining permanent fixation of the chest wall in this region. Temporary interruption of the upper seven intercostal nerves posteriorly has been used frequently, and we believe contributes considerably to the patient's postoperative comfort.

The interval between the operations should be determined entirely by the patient's condition and reaction to surgery, and the changes which occur in the tuberculosis under observation. This interval has varied widely from two weeks to months, with an average of approximately three weeks. Certain patients who are poor risks may stand one operation relatively well, but do badly if subjected to additional procedures within a short period of time. Occasionally, it is wise to perform one operation and then wait even several months before proceeding with others. Even if it is necessary to re-operate the original ribs at the end of this time, the patient's improvement renders the delay valuable in spite of the reoperation required. Many patients, who have been subjected to a series of stages at intervals of three weeks could easily have been operated upon after only ten to 14 days' delay, but the additional week of waiting has enabled the patient to improve to the extent that he finishes the series in excellent condition, and at approximately the same weight as when he started. The blood loss in thoracoplasty varies somewhat, but it need not be excessive if careful attention is paid to hemostasis. In our experience, actual determination of losses for stage operations has been as follows:

Upper stage posterior (3-4 ribs) 450 cc.
 Lower posterior (3-4 ribs) 196 cc.
 Intermediate posterior (3-4 ribs) 296 cc.
 Anterolateral (3-4 ribs and cartilages) 250 cc.

This, we are confident, is considerably lower than is frequently seen where the whole operation is performed in a pool of blood.

Result of Thoracoplasty

Extrapleural thoracoplasty has been used in the treatment of pulmonary tuberculosis at Glen Lake Sanatorium for over 15 years, during which time more than 900 operations of this type have been performed on approximately 360 patients. From this group, 262 or 78.8 per cent are still alive, leaving a total mortality for all times and from all causes of 21.2 per cent. This is a surprising figure when one considers the time period, and the fact that all patients were suffering from pulmonary tuberculosis of a more or less advanced degree. One-half of this mortality has occurred in the period ranging from one to several years following the completion of the surgery. The operative mortality within two weeks is 4.74 per cent within the first two weeks,

6.42 per cent in four weeks, 7.26 per cent in eight weeks for the whole series as calculated on the basis of the number of patients. If calculated on the basis of operations performed, the figures for the same time period will be approximately 0.4 of those quoted above. It is of interest to note that 77 per cent of the mortality occurred in the first 45 per cent of this series, and that since 1931 the operative mortality within two months calculated on the patient basis has been 1.7 per cent, while the mortality on the operation basis for this same period has been 0.88 per cent.

If we now consider only patients upon whom thoracoplasties have been performed more than two years ago, *i. e.*, from 1922 to 1934 inclusive, we find that 185 of the 264 patients operated upon, approximately 70.1 per cent, are still alive, and that of this group 161 or 87 per cent are capable of performing some useful work. It is extremely difficult to evaluate properly all of the factors involved or to express in figures all that surgery may have accomplished for these individuals. A life saved is a notable accomplishment, but a life prolonged may likewise be a very praiseworthy attainment. The elimination of bacilli-laden sputum from a patient who is returned to his home, while frequently not considered, may prove of inestimable benefit to the community as well as to the patient. Without surgical help, the vast majority of these patients have little to expect save the life of chronic invalidism. Following successful surgery, the whole outlook may be changed. Each individual so rehabilitated contributes his share to encourage the surgeon to persevere in the work in the face of many disappointments.

Bilateral Collapse

With increased knowledge of collapse therapy and chest physiology, surgeons have gained confidence and experience, which now enables them to cope with bilateral tuberculosis, particularly that involving the upper portion of the lungs only, with the resultant saving and rehabilitation of a considerable number of individuals who previously were considered beyond all help, if they did not recover under conservative treatment. Bilateral pneumothorax, if possible and satisfactory, may prove the most efficacious of the group of procedures available, but it requires careful handling if consistent successful results are to be obtained. It may be used either as an alternating or simultaneous procedure. Intrapleural pneumonolysis may be done in the presence of bilateral pneumothorax if indicated, and without undue risk if judgment and care are used. Various combinations of pneumothorax with contralateral phrenic nerve surgery, extrapleural pneumonolysis, and thoracoplasty, have been successfully carried out at Glen Lake Sanatorium for years. Likewise, bilateral extrapleural pneumonolysis and extrapleural paraffin with contralateral thoracoplasty have been utilized. Bilateral partial thoracoplasty is perfectly feasible, but is the least desirable of all of the bilateral methods, and should be used only when nothing else will suffice. The results of many attempts at

bilateral collapse for bilateral pulmonary tuberculosis will prove disappointing because of the extent of the disease, and the conditions encountered. The risks increase and the chances of successful rehabilitation diminish as the amount of reserve breathing-space is reduced, and the inevitable minimum compatible with life is approached. Nevertheless, we feel that many such attempts are justifiable, but that the operator and patient should fully recognize the possibilities and not allow themselves to be carried away by too much enthusiasm.

When Surgery Is Indicated in Pulmonary Tuberculosis

When it has once been decided that surgery is necessary in the patient suffering from tuberculosis, every effort should be made to the end that the patient may profit, rather than suffer, from the surgical intervention. This will consist, in the case of emergency surgery, in performing the minimum amount of surgery which is consistent with the proper surgical management of the pathological lesion present, in selecting the proper anesthetic or combination of anesthetics which will permit the proper handling of the situation with the least possible trauma to the pulmonary lesion, and in the administration of adequate postoperative care to return the patient to the normal conditions of the "cure" as soon as possible following the operation.

Considering the first point mentioned, it is a well-recognized fact among men dealing with tuberculosis that at times even very slight trauma may be followed by an exacerbation or spread of the tuberculous lesion in the lung. For this reason, when an emergency arises and surgical intervention must be undertaken, the surgeon should limit himself strictly to caring for the emergency lesion, and postpone until another time the surgical handling of other non-emergency conditions accidentally discovered. To do otherwise may mean to sacrifice the patient's chances of recovery from tuberculosis for the sake of a simpler lesion which is not at the moment causing the patient any particular difficulty.

Anesthesia

The selection of the proper anesthetic is not always easy. It should provide an anesthesia which is adequate to permit the surgeon to care for the situation at hand without embarrassment or handicap, and yet, it should at the same time be of a type which does not irritate or favor the dissemination of tuberculous disease. Spinal anesthesia is a distinct boon for the patient suffering from pulmonary tuberculosis who must undergo abdominal surgery as an emergency procedure, for it provides maximum relaxation without in any way traumatizing the lungs or interfering with the cough reflex. Should spinal anesthesia prove inadequate for the complete procedure, it may easily be supplemented by local infiltration of the abdominal wall, or anterior splanchnic block if necessary. Local infiltration, field or nerve block with procaine, may be perfectly adequate for other lesions, if the surgeon be skilled in their use. The use of gen-

eral anesthesia is to be avoided if possible in the presence of active pulmonary tuberculosis, because of the trauma to the lungs from deep breathing as well as for the increased possibility of aspiration of tuberculous material into new areas of the lungs, if the anesthesia reaches the stage where the cough reflex is depressed. The anesthetic chosen should be picked with due regard for the pulmonary lesion. Ether, because of its irritating quality, should be avoided, if possible. If general anesthesia is necessary, cyclopropane or ethylene may be used and are especially valuable because of the high oxygen concentration used with them. Nitrous oxide of course must be used if cautery is to be utilized, but for other work, particularly in the face of diminished vital capacity or collapse of some type, it is not especially good because of the attendant cyanosis. Where anesthesia of short duration is required, the intravenous administration of barbituric acid derivatives, such as pentothal sodium and evipal, may be valuable; but it is well to remember that these agents produce a very deep anesthesia under which aspiration can easily occur. It is well to remember that a great many extensions of pulmonary tuberculosis are the result of bronchogenic dissemination of tuberculous material into new areas of the lung. General anesthesia, or intravenous anesthesia, to the stage where the cough reflex is obliterated, favors such dissemination, particularly in patients raising sputum and in whom some manipulation is carried out upon the lung to force sputum from the cavity into the trachea or bronchi. A stormy anesthetic, or one administered by an unskilled anesthetist, may intensify all of these factors and do the patient a great deal of harm. For similar reasons, the use of doses of opiates sufficiently large to suppress the cough reflex postoperatively is to be avoided if retention of sputum and aspiration are to be obviated.

Selection of Time for Elective Surgery

The selection of the proper time for carrying out surgical intervention of an elective type in the patient suffering from pulmonary tuberculosis may be just as important in the aggregate as the type of surgery performed or the surgical technic itself. Wide experience in the handling of tuberculous individuals is of untold value in handling this problem. Close coöperation of the phthisiologist, internist, roentgenologist and surgeon is essential if the best results are to be obtained. The first consideration, when deciding upon surgery of this type, is the activity of the pulmonary tuberculosis. The patient suffering from active pulmonary tuberculosis may, and not infrequently does, react badly to any surgical intervention. He may not die on the table or within a week or two following the surgical procedure, but his pulmonary tuberculosis may be stirred up or spread, and his chances for recovery jeopardized or destroyed thereby. Pulmonary lesions are on the average more dangerous to life, more treacherous, and more easily disseminated or reactivated than other tuberculous foci. At times, even very slight trauma or manipulation such as a dental extraction, a tonsillectomy or a slight fracture, may be

followed by renewed activity of this disease. Such ill effects may not be manifest at once, but only become evident some time later. While a number of these apparent ill-effects may be purely coincidental, they occur frequently enough to engender extreme caution in undertaking surgical manipulation in the presence of active or recently active pulmonary tuberculosis. The first thought then, in selecting the time for the performance of an elective surgical maneuver in the patient suffering from pulmonary disease, should be to delay surgical intervention until the pulmonary lesion has become quiescent or arrested, if possible.

It has long been recognized among tuberculosis workers that the majority of patients do their coughing and raising in the morning, and may be relatively free of symptoms for the rest of the 24-hour period. In order to take advantage of this, we have for nearly 15 years performed thoracoplasties and other major surgical procedures in the afternoon, when cavities are most likely to be empty.

During certain procedures, such as extrapleural thoracoplasty, the position of the patient on the operating table, and in bed postoperatively, may be important from the standpoint of possible sputum aspiration. In order to reduce this danger to a minimum, we have for more than ten years used the three-quarter prone position for thoracoplasty, rather than the lateral position so commonly utilized. Likewise, we have been extremely careful to avoid turning the patient onto the good side, either as he is being removed from the operating table or from the litter to the bed. Postoperatively, the patient may assume any position except on his unaffected side. I believe that our low incidence of aspiration spread of tuberculosis following surgery is definitely related to this practice.

No patient suffering from tuberculosis should permit his resistance to become lowered for any reason, if he can avoid it. No surgeon treating tuberculous individuals should excessively traumatize a patient and thereby lower his resistance, if he can possibly prevent it. Excessive blood loss, unnecessary roughness or trauma, and too extensive operations, take too much out of the tuberculous patient, and are to be avoided. It is a mistake to assume that transfusion at the end of an operation rectifies all of the damage which has been done, although, undoubtedly, following excessive blood loss, it may help the patient to survive. It is, likewise, unwise to assume that an extensive procedure performed in 15 or 20 minutes is any less brutal than if it were performed in twice the time. Thoracoplasty, for example, performed in this way, may, and frequently does, leave the patient in deep shock from which he rallies only with difficulty; whereas the same operation performed under local anesthesia in a much more gentle manner with more attention to hemostasis in three or four times as many minutes, may leave the patient tired but in good condition and insisting that more surgery be done. In our entire major collapse series, approximating a thousand operations upon some 400 individuals, including extrapleural

thoracoplasty, extrapleural pneumonolysis, unroofing of empyema, *etc.*, we have found transfusion necessary but once, and that several days postoperatively for a hemolytic streptococcal infection. But 25 per cent of patients in this entire series have required intravenous glucose or saline postoperatively. Shock and serious blood loss leave the patient weak and debilitated, and an easy prey for the lurking tubercle bacillus which, unfortunately, is not similarly affected by the surgical maneuvers. Tuberculous individuals do not have the recuperative powers of normal individuals and in addition are constantly in danger of undergoing progression or exacerbation of their original disease, and should therefore be protected in every way possible from unnecessary lowering of resistance if complications are to be avoided. For the same reasons, extensive surgery should not be undertaken during very hot weather or epidemics of respiratory disease.

Postoperatively, these patients require special care. The maintenance of an adequate fluid balance and proper nutrition is of course essential. Because of the chronic disease, they may be somewhat anemic and subsequently regenerate blood less rapidly than normal individuals. Great care must be exercised in patients suffering from tuberculous disease of the lungs to see that the patient raises his daily quota of sputum each postoperative day in order to avoid retention, sepsis or extension of the disease by aspiration. Care must be taken to avoid allowing the patient to assume positions which will favor aspiration of infectious material into the sound lung. Intensive treatment for tuberculosis, to reduce the chances of exacerbation of the disease or to enable the patient to control it, if it has occurred, should be insisted upon in all individuals subjected to surgery. It is extremely unfair to these patients to perform surgical operations upon them, and then attempt to rehabilitate them in the same time which would suffice for a healthy individual. Tuberculous patients should probably spend at least twice as much time in bed postoperatively as a non-tuberculous individual, if there is no demonstrable activity of the disease, and a much longer period if even a suspicion of activity is found. These patients should, likewise, be examined and X-rayed repeatedly for months following the surgical intervention in order to discover as early as possible any reactivation or extension of tuberculous disease. Much of this may seem unnecessarily complicated to those who are accustomed to dealing only with non-tuberculous individuals, but those familiar with tuberculosis know that it is extremely treacherous and one cannot be too careful in the handling of the individual suffering from it.

Multiple Tuberculous Foci

Tuberculous individuals not infrequently are confronted with the problem of contending with not one but even several metastatic foci of disease. The successful treatment of one lesion without the proper handling of the others will not rehabilitate the individual. The problem becomes increasingly complex as the number of foci increase, yet while the problem at times seems hope-

less, it is often surprising how much can be accomplished in certain individuals so handicapped. The pulmonary lesion is as a rule the most dangerous to life, and therefore requires first attention. Certain other foci, such as tuberculosis of the larynx or of the intestinal tract, are secondary to the pulmonary process and tend to retrogress as the pulmonary disease is brought under control. The presence of extrapulmonary foci in general constitutes an added indication for surgical collapse more frequently than a contraindication to it.

The element of time in the recovery of tuberculous individuals is all important. Recovery time for these patients is not measured in days or weeks, but in months or years. Good results may be obtained in five, six, seven or eight years, which would be absolutely impossible in short periods of time. Patience, perseverance, encouragement, rest and subsequent surgery and then ever more rest, may save many lives and rehabilitate many individuals. The more experienced and careful the physician, the greater his knowledge of tuberculosis and his patience in dealing with it; the more he can accomplish in such complicated situations. The following example may seem extreme, but it is only one of a considerable series of individuals who have been rehabilitated in this way. V. M., age 21, is a girl who, in the course of eight years with the help of institutional treatment and surgical aid, has successfully conquered the following tuberculous lesions, and is now rehabilitated and working: (1) tuberculous peritonitis and salpingitis (salpingectomy and draining abdominal sinus for two years); (2) tuberculosis of the right knee (spontaneous healing); (3) pulmonary tuberculosis (pulmonary hemorrhage—controlled by artificial pneumothorax); (4) tuberculosis of the tarsal bones (treated surgically by Ollier resection); (5) tuberculosis of the first and second lumbar vertebrae with psoas abscess (drainage and spinal fusion). In spite of all of these lesions, this girl has controlled her tuberculosis, and now occupies a very responsible position. Without adequate institutional care and the judicious application of surgical procedures, such a recovery would not have been possible.

Conclusions

Tuberculosis is a constitutional disease with protean manifestations. Its successful treatment requires prolonged, intensive rest and more prolonged supervision, and not infrequently the judicious use of surgical intervention to relieve or treat local complications. It is not a medical disease, nor is it a surgical disease, but one in which all specialties may add something to the individual's chances for recovery. Institutional management intensively applied for a long period of time is essential to recovery in many instances. Surgical intervention, wisely-selected and properly applied, may contribute much toward the recovery of the individual, and frequently proves the deciding factor in making recovery possible.

College Mental Hygiene*

Henry C. Schumacher, M.D.†

Cleveland, Ohio

SO MUCH has been written in recent years on this subject that what one now says is to a great extent a repetition. However, so many colleges are still doing so little in this field that it is worth while to discuss the subject from time to time. True, the opinions of psychiatrists are often under suspicion. The public, including educators, still believes much maladjustment is the individual's own fault and that in a certain sense, he is paying a justifiable penalty for his offenses. Then, too, there is the opinion that since college students are (but not all are) intelligent beings they should be able through reason to solve their problems. Mentation, however, implies much more than intelligence. Furthermore, many of the maladjustments of the college student have their origin in his early years when intelligence and reason are not highly developed. It should also be pointed out that far too much of the school and college time is spent in instilling knowledge, much of which is of little value in solving or aiding in the solving of life's real problems.

One important objective in education is often lost sight of. I am referring to the need, in addition to the mastery of subject matter, of the development of the students into acceptable and efficient social human beings. Sheer intellect alone does not determine success, for I am sure all of us know men and women possessed of good intelligence but unable to use it in a constructive way. Many of these are blocked because of personality disorders. Unfortunately, many who finish college and university with adequate grades in subject matter fail to make the grade in the world after leaving school. This fact is clearly and forcibly presented by Anderson and Kennedy¹ who note that of 646 college graduates selected by able business executives, in coöperation with personnel experts in colleges, for responsible positions, over a period of eleven years, 190 were definitely unsuccessful. This represents about 30 per cent of the entire group admitted. And in passing it should be noted that this 30 per cent represents only those known to have been unsuccessful and does not include that indeterminate number of young people who quietly resigned for some, to them, sufficient reason. Nor does it take into consideration that group who just stuck at the level where they started, which group comprised about 20 per cent. As a result of this experience, this organization then decided that all applicants for training should be seen by psychiatrically-trained people. As a result, now, around 90 per cent of its placements, according to psychiatric recommendations, have made good. However, of 344 college men and women who during one year

(1930) applied for training and were psychiatrically-examined, two only were sufficiently outstanding to justify employment on the training unit, while 30 others were promising. That means that only 9 per cent were accepted at all, and only a little more than one-half of one per cent were selected for executive training.

Such facts and figures clearly show the need for college mental hygiene. Dr. Frankwood Williams⁶⁷ states the aims of mental hygiene in the college to be as follows:

- "1. The conservation of the student body; that intellectually capable students may not be forced unnecessarily to withdraw, but may be retained.
- "2. The forestalling of failure in the form of nervous and mental diseases, immediate and remote.
- "3. The minimizing of partial failure in later mediocrity, inadequacy, inefficiency, and unhappiness.
- "4. The making possible of a larger individual usefulness by giving to each a fuller use of the intellectual capacity he possesses, through widening the sphere of conscious control and thereby widening the sphere of social control."

Many studies by college psychiatrists have attempted to estimate the number of students needing psychiatric aid. In great part, such estimates are based on relatively brief contact with the student. However, in order to bring the subject as forcefully as possible to attention, let us quote some of these findings.

In a study of 1300 freshman men at the University of Minnesota, Morrison and Diehl⁴⁵ found 17.8 per cent with a history of abnormalities serious enough to indicate the need for treatment. Blanton⁵, in a study of 1000 unselected junior and senior students of Wisconsin, estimated that 10 per cent of the student body had maladjustments serious enough to "warp their lives, and in some cases cause mental breakdowns unless properly treated." Cobb¹¹ of Harvard examined all incoming freshmen from a psychiatric standpoint, and found more than 16% in danger of becoming victims of neurosis if not actual mental disease. And Pressey,⁵³ in a study of 100 women undergraduates at Ohio University, found all but 12 with at least one problem which was considered to be serious. There have been other such studies. The striking thing is that in all of them 10 to 15 per cent of the student body is found to be so badly in need of psychiatric attention that without it they are in danger of developing serious mental difficulties and a much higher percentage show some personality defect.

In a recent study Raphael⁵⁴ reports his experiences at the University of Michigan. Taking as a basis for his

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† Director, Child Guidance Clinic; associate professor of mental hygiene, School of Applied Social Sciences; associate in pediatrics, School of Medicine, Western Reserve University.

study the class of 1934, he presents the following facts: there were a total of 526 students studied, of whom 411 were men and 115 were women, or three and one-half times as many men as women; 77.8 per cent were rated physically as excellent or satisfactory. However, as might well be expected, there was a higher incidence of significant somatic handicaps in this group than for the school as a whole. On psychological test, the general distribution appeared to approximate quite closely that of the class as a whole. Of more importance is the actual diagnosis of those studied. Of the 526 individuals, only 11 cases or 2 per cent were considered as being psychotic. Nineteen cases or 3.6 per cent showed some form of organic central nervous system disorder. Fifty-three or 10 per cent were considered reactionary depressions; 196 or 37.2 per cent showed definite psychoneuroses or psychoneurotic reactions. Eleven cases or 2 per cent were diagnosed psychopathic personalities, thus leaving 236 or 44.8 per cent of the cases which were adjustment problems of non-clinical type.

There is probably no single factor that precipitates the maladjusted state, rather the maladjustment occurs as a result of the interplay of one or more subjective or innate factors, and one or more of the environmental factors under which the individual lives. The conflict, then, is one between the internal forces of the individual and the external forces of his environment. Raphael in his excellent article lists the factors in the problems of the students under primary and secondary factors, respectively. The reader is particularly referred to this article. Here I shall list only those factors as found by Raphael to occur in 14 or more per cent of the cases.

Primary Factors

	Perc. of Cases
1. Pronounced tendency to excitability and tensional response	40.3
2. Worry over school work	40.1
3. Poor orientation to university as part of life situation	33.4
4. Instability and over-impulsiveness	31.8
5. Actual physical disturbance and residual states	29.4
6. Over-sensitivity	23.3
7. Immaturity	20.5
8. Stress of transition to university environment from relatively simpler setting	17.4
9. Poor dependability, lack of regularization, poor self-discipline	17.0
10. Poor scholastic achievement	16.5
11. Fatigue	15.9
12. Worry regarding possibility of disease	15.2
13. General problem of sex adjustment	14.3
14. Marked feelings of inferiority	14.1

Secondary Factors

1. Immaturity	56.7
2. Inadequacy, over-dependency, and oversuggestibility	43.8

3. Over-sensitivity	43.4
4. Instability and over-impulsiveness	39.3
5. Marked feelings of inferiority	37.5
6. Pronounced tendency to excitability and tensional response	36.4
7. Poor socialization	29.0
8. Poor orientation to university as part of life situation	22.4
9. Poor general family background	22.2
10. Worry over school work	19.1
11. Poor habits of living, including over-use of tobacco and alcohol	16.8
12. Inadequate recreational outlets	16.8
13. Poor dependability, lack of regularization, poor self-discipline	16.3
14. General problems of sex adjustment	16.1
15. Egocentricity; tendency to negative defense reactions	14.8

My own experience over a period of ten years as consultant psychiatrist to several Ohio colleges bears out Dr. Raphael's findings.

Probably some highly abstracted case studies will present some of these conditions more concretely and realistically.

Case 1. A girl, a sophomore in college, is a short stockily-built girl of the pyknic type. She gives a history of periodic swings of mood. However, since entering college such mood-swings have become more pronounced. Her mother died a manic-depressive. The girl was reared in her grandmother's home and except for a somewhat rigid religious training her childhood was uneventful. However, even in high school her marked mood-swings were noted. When elated, she rushed headlong into activities and found the small college town boring. As a result she comes to the city and goes on drinking parties. After a while her mood shifts, and in her depression she is self-accusatory and expresses the wish that she might do away with herself. During her free intervals she is an excellent student.

Here we are dealing with a girl of strong manic-depressive tendencies. Before treatment could be undertaken, this girl suffered a complete break, and was institutionalized. Following her recovery from this manic attack, she did not return to college.

Case 2. A boy age 21, referred by the mental hygiene department of a large university because of failure in academic work. He is the fourth of five siblings. The first born child, a boy, died in early infancy, the second is a girl, the third a boy (long longed for and given the name borne by the child that died), the fourth the patient, and the youngest a girl.

As long as our patient can remember, he has felt that he wasn't given a square deal by his family. He was convinced that the older sister and brother got more affection and more of the material things of life than he. His youngest sister, the baby in the family, was the pet of all the others. As an elementary school child

he found it increasingly more difficult to get along with teachers and pupils. He felt he wasn't getting any "breaks." During his high school days he attended three institutions—a private school, a public high school and a tutorial school. He can give no definite reason for his difficulties except that he felt unfairly treated. In comparing the three high schools he felt that he was happier in the tutorial school and this because he was receiving much more individual attention and so he felt more appreciated. However, on entering college he was again one among many. His resentment and feeling of unfair treatment once more cropped out. With the months this feeling grew. To it he reacted by studying less and less. He said, "I lost interest in my studies and wanted to get away." His first semester's grades were bad, and he was duly warned. By the middle of the second semester his work had fallen down so badly that he was given permission to resign and had he not done so, he would have been dismissed. In the early interviews he brought out his resentment of the family, and told of his desire to travel, to see the country. He felt himself to be the black sheep of the family, and didn't feel he could make a go of work with his father and brothers, or under anyone. So, in an attempt to escape, he rationalized, travel would be the equivalent of an education. Also, through this means he could force the parents to support him.

An interpretation of his behavior emphasizing his ordinal position in the family—the child between the longed-for boy and the "baby" girl, both of whom because of parental attitudes had positions of great advantage over him—was given him. This brought up many memories of his early reactions to older brother and his feeling of jealousy of baby sister. Bit by bit he began to see how this gave rise to his feeling of resentment to parents and parent substitutes. One day he remarked, "If I told my parents how I have felt all these years, they would just laugh at me." Gradually, he began to see how his reactions had conditioned their outward behavior to him. On changing his own behavior, he found that they accepted him in the same way they did the others. Where at first he felt he never could work under anyone, he soon discovered, on going to work, that with his new understanding it was not difficult at all to take orders. At present he is making good at work and home adjustment.

Case 3. A girl age 20, referred by the personnel officer of a college because she was failing in her studies, and had been told by the dean's office that she could not continue in college unless she passed all of the first semester's work.

The father died when she was five years old. The father, a college graduate, was artistic and had done some creditable work in art. However, this had never been acceptable to his mother, a domineering woman. After the father's death, the paternal grandmother wished the patient's mother to make her home with her. The mother, however, did not wish to be under the domineering influence of the grandmother, and so made

a bargain with her that the eldest daughter, our patient, would live with her grandmother, in exchange for which grandmother would contribute to the support of the mother and siblings. Our patient grew up with the feeling that she had to respect and obey grandmother in all things. Grandmother wished her to learn languages. However, as the girl grew older, she turned more and more to art, which did not meet with the approval of grandmother. The grandmother drilled the girl in English and French until our patient states she would have temper tantrums, and refuse to go on. However, grandmother would always come back to it. The patient is well aware that in this way she built up a strong dislike for languages, particularly for French.

In her first year at college she was particularly unfortunate in her English teacher, an elderly woman who in every respect reminded her of grandmother. This teacher spent much time in discussing what girls ought to do, how they ought to live and why they owed respect to parents, *et cetera*. The patient brought out very strikingly her resentment of this teacher on the basis of identifying her with the grandmother. This, of course, was the basis of her failure in English.

As long as the girl was in rebellion and trying so desperately to emancipate herself from the grandmother's domination, she had to reject the study of languages. The whole question of adolescent rebellion and the need to emancipate herself was gone into very thoroughly. The reasons for her choice of art as a career—it was the father's chief interest and emphasized rebellion against grandmother—was discussed. Her previous work in art, however, justified us in agreeing to her plan to study art in art school. She dropped out of college and entered art school.

Case 4. A colored boy, age 18½, referred by a college physician because of difficulties in his gym work and because of his physical complaints, such as distention of abdomen, throbbing headaches, palpitation, twitching of muscles—all following his gym classes and related by him to the gymnasium work.

This boy had attended a high school for colored and came to a Northern college with a certain hesitation. His relatives and friends had advised him to attend a college for colored in the South. However, he was ambitious and felt he could get better training in the North. He came with a definite determination to make good. In this he had, on the whole, been quite successful, except for his gym work. He said gym was a subject he didn't have much of in high school. He found, therefore, that all the others in the class were doing better than he could do. He wanted to get out of gym, but it was a required subject. He wrote his folks, telling them he would like them to aid him in getting out of this work. Instead, his father and brother wrote, encouraging him to stick it out, and that it was a mark of failure to give up. This hurt his pride, but didn't make gym work more pleasant.

At Christmas time when he came home on holidays the first question his mother asked him was, "Son, did you give up gym?"

He couldn't understand why father, mother, and brother were all against him. He began to feel that everyone was against him. Seeing no way out of gym, he converted his mental conflicts over into physical symptoms—at first quite consciously. He was excused from gym for a week, and following his return to gym work his symptoms became worse. He, at the time of referral, already had been transferred to a special class section for gym work. Here he could hold his own better, but he knew he was not doing as well as many others.

Then, too, he states that early in the school year he overheard some boys say, "We don't want that nigger to play on our side."

This added to his conflict over gym.

The boy was a bright lad, and in the one interview was soon discussing his hysterical conversion symptoms, and the causes that had brought them about, in a very objective way.

The boy made a good adjustment to his special gym class. He no longer complained of physical ill effects.

Case 5. A girl age 26, referred because of poor scholastic work and her irritating behavior in class.

The patient is the third child in a family of four, the oldest and youngest are males. Her father, now deceased, was a meek, easy-going man who left the discipline to the mother, a domineering woman. The patient as a child felt rejected by the mother. Now she cannot remember ever considering her as a mother, but looks upon her as a person whom she hated. The eldest brother was much beloved by mother and in a definite sense was the man of the house. The patient admired him very much and resented the mother's interest in him. She recalls incidents when as a child she would lie down beside him. He and the patient's sister did not get along well. At the time the sister was entering adolescence he was constantly reprimanding her on account of her behavior with boy friends. As a result our patient tried in every way to be different from the sister and hence the two have been at odds with each other. This made it impossible for the patient to act the way her sister did. The sister, a lively vivacious girl, did excellent school and college work. The patient, in order to be different from sister, tried hard to act totally different toward classmates and teachers. Instead of studying and getting good grades as did the sister, she did poor work and argued much with her instructors which not only antagonized them, but also her classmates. On finishing normal school, she taught—her sister had also gone into teaching. Her antagonisms to mother and sister were transferred to women principals under whom she taught. Because of failure to be promoted, she sought a way out of teaching. For many years she had been going with a young man whom her brother had befriended. Though not overly interested in him, she married him and thus had to resign her teaching position. She now re-entered college. She wanted a career, so that her brother would be proud of her and also to surpass her sister. However, all her old attitudes again cropped out. In addition, she now began to complain

of being sick and began to entertain ideas of going insane. Analysis revealed her strong attachment to brother and her hate for her mother, based on her resentment of mother's interest in him. The brother's interest in her sister's welfare caused her to resent the sister and to act totally different from her. Sexually, she became prudish. She married a brother-substitute, but could not be happy with him because in his work and habits he was so different from the brother, and because of her feelings of guilt. Her complaints and fears of insanity were motivated as means of escape from her unhappy marriage. A career signified power and a means of regaining her brother's interest in her, since he had married and now showed no particular attention to her; in fact, he was rather annoyed by her behavior.

A knowledge of mental hygiene, particularly as it relates to family relationships, should have made the teacher's college instructors and officials aware of this girl's difficulties, and thus have avoided failure in school, in teaching and in marriage, and necessitating a long analysis.

These cases, I hope, will serve to show that the mental hygiene problems found among college students are very similar to those found outside the walls of college and university. They are problems of people in emotional distress over failure in emancipation from the home and in the establishment of healthy attitudes toward social and sexual adjustments.

How then, can this problem in college be met? Well, first of all, the college must exercise greater discretion in the admission of students. Those not qualified should not be admitted. Secondly, the educational program must cease its exaggerated one-sided emphasis upon the value of intellectual attainment as a method of preparing for life. Thirdly, under modern conditions the college cannot expect as well-adjusted a student body today as was true years ago, for it must not be forgotten that since 1880 there has been a 700 per cent increase in college enrollment, and that the main impetus in the increased enrollment has come since 1920. The student body is much more heterogenous than formerly. As a result, college adjustment is a difficult problem for many students. They need help. Freshman week, orientation programs, advisors and counsellors—all of this is evidence that the college has some recognition of the need.

Certain colleges offer a series of lectures in mental hygiene. We favor such a program of lectures, open to freshmen, provided it is under the direction of a competent instructor. The course itself should center around the common problems of the students. Such a series of lectures might well begin with a full discussion of the physical development of adolescence. It will be found that not only are the freshmen not far removed from the beginning of adolescence but what is more important many of the problems that confronted them then still await understanding. Here, of course, a full discussion of normal sex development with its resulting tensions can be discussed. Even more time can be spent on

the social development of this life period. It might be well for all students to get some clear appreciation of the rôle the public initiation ceremony has played in the cultural history of the race, for they will meet with some modern hang-overs and substitutes, such as fraternity initiations, attitude in general to freshmen, *etc.* The social relationship between the sexes is also a problem worthy of attention.

Since college days are for many students their first experience away from home, a full and free discussion of the rôle of the family and emancipation therefrom should receive consideration. Many of the problems of adjustment grow out of this new freedom from home. Another topic that requires emphasis relates to the moral and religious attitudes of the student. Religious doubts are relatively frequent at this age. Such doubts may be engendered by a desire to break away from a too-strict and overmoralized early training, or because the student is in conflict over sex and now questions religious teaching because of the restraints it places upon him. History and science courses often cause conflicts because of the narrowness of the previous training of the student, and last but not least, one should mention the modern vogue of skepticism. Now morality and religion are intimately related. Hence, a sound attitude to religion is basic.

Then too, there might well be lectures on temperament and intelligence. Here such simple facts on temperamental differences in response should be discussed as well as giving the student a wider interpretation of what intelligence is. Also, the subject of vocational guidance could be discussed. We could, of course, extend the list of topics greatly. What I wish to emphasize is chiefly this, that the topics should center about the commonplace problems of the students and avoid an overemphasis of the morbid. True, certain types and modes of responding could well be discussed, but such a course as I have in mind should not be primarily a course in abnormal psychology. And just because I feel it should not be morbid and primarily abnormal in its orientation, its instructor must be carefully chosen. The course must be practical and must above all be understandable by the freshmen.

In addition to such lectures there should be provided opportunity for personal conferences. In fact, the major part of the time of the personnel available for this work should be so devoted. Here again let me emphasize that the soundness of those doing this work is all-important. Not all educators well-qualified in their subject matter are fitted for student counselling and much mischief is done students by assuming this. No one is a good counsellor who hasn't a fair acquaintance with psychology, sociology and modern psychiatry, as well as a real interest in human nature.

For a mental hygiene program to succeed, the interest and coöperation of the faculty is essential. That means that the members of the faculty will need to be informed of what the program aims to accomplish and why. Many a faculty member has become so absorbed in his own field that to a considerable degree he has lost contact

with the problems of every day life and youth's relation to them. A program of education is therefore essential.

And now just a few words about the administration of such a program. Needless to say, the small college may not find it possible to have full-time personnel. However, as we have already indicated, personnel now on the campus may be entrusted with a good share of the program. This particularly holds true of the lectures in mental hygiene. Then, too, students are now coming to deans and counsellors and other members of the faculty for advice and guidance. Probably it would be well for the personnel so engaged to have a regular time to get together and discuss the problems that have come to their attention. Ideally, of course, the mental hygiene program should be under the leadership of a competent psychiatrist, and in a large college there could with advantage be attached to his staff a well-trained clinical psychologist, and one or more social workers qualified for such work. Even in the small college, there should be opportunity for psychiatric consultation.

Needless to say, there should be the closest working relationship between the deans of men and women, vocational counsellors, and the psychiatric unit or the psychiatrist. One ought not need to point out that the therapeutic work should be entrusted only to competent specialists in psychiatry. The professor of psychology may have a good understanding of the theory underlying mental difficulties, but almost always he is lacking in clinical experience and in a true appreciation of the organism-as-a-whole.

I do not mean to imply that all problems in mental hygiene should come to the psychiatrist—there are many problems which the deans, the personnel officer, and the vocational counsellor fortified with a knowledge of mental hygiene, can and should handle. However, many of the disciplinary problems are so intimately tied-up with emotional maladjustment that psychiatric referral is a wise procedure. Probably, however, the ideal place for the mental hygiene program to be administratively placed is under the direction of a psychiatrist in conjunction with the student health service, a service organized to look after the health and hygiene of the student body. Such placement would insure a complete study of all incoming students, and through the infirmary and consultation rooms for whatever physical health purpose, permit contact with the vulnerable students. Furthermore students would feel freer to come to the health center if the psychiatrist were housed there rather than elsewhere; the object should, of course, be to have the student feel just as free to consult the psychiatrist as he would any other physician.

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COLLEGE MENTAL HYGIENE

Discussion by L. W. Sontag, M.D.†

Mr. President and Members of the Ohio Student Health Association:

May I express my appreciation for Dr. Schumacher's excellent paper? It brings before us very clearly the need for, and most

† Director of research, Antioch College.

desirable set-up for, mental hygiene work in college. I think Dr. Schumacher's ideas about the teaching of mental hygiene to freshmen are excellent.

Since time immemorial, relatively speaking, education has been concerned primarily with the intelligence quotient or I. Q. It is only recently that psychiatry has begun adequately to emphasize the fact that intelligence and mental achievement alone are not sufficient for happiness. It is fully time for the educational institutions of the world to recognize the necessity for developing emotional, as well as intellectual, maturity. It is time we evolved an emotional quotient or E. Q. as well as an I. Q.

There are many reasons why a mental hygiene program should be started not at the college level but at the pre-school level. It is as early as pre-school that the origin of many emotional disturbances may be found. When a child takes scarlet fever germs into his system, he has a relatively short time to wait before contracting the disease in a form which will rapidly make itself apparent, and send him to a physician. The disease, in the case of scarlet fever, is usually acute and is as a rule cured by the specific resistance developed by the body itself. The etiology of emotional problems, however, is not so apparent nor so rapidly productive of manifestations which immediately attract the attention of untrained assistants. Therefore the effects of an unhealthy emotional situation may not be apparent until

many years later. Despite the fact that it would be logical to start the mental hygiene program with pre-school children, such a plan is as yet impossible.

At the present time, colleges offer us the most plausible and possible opportunity for the application of mental hygiene supervision and care. The college period does have the distinct advantage of offering first, an opportunity for the observation and study of emotionally-disturbed individuals, and second, it offers an environment which is plastic enough to be used considerably to fit individual needs. It is not easy to change a man's wife when it seems desirable to do so for his mental equilibrium, but it is not difficult to change his room-mate.

In most colleges there exist admirable plants for caring for the body health of students. It seems not too difficult to enlarge the scope of these institutions to include the mental health of the student as well. It is futile to argue the relative importance of physical and mental health since the lack of either is destructive of life.

It is fully time that we heed Dr. Schumacher's warning by adding to our health service facilities for caring for the emotional fitness of our students and of even greater importance, that we broaden our vision of health to include emotional health as well as physical health.

L. W. SONTAG, M.D.

Book Notices

NEUROLOGY WORK

A Textbook of Nervous Diseases in Infancy and Childhood, by FRANK R. FORD, M.D.; 1st American edition, heavy blue cloth, gold-stamped, 938 pages plus appendix and index, illustrated; Springfield, Illinois: Charles C. Thomas: Publisher: 1937. Price, \$8.50.

Neurology is the most disputed territory in medicine. It was first captured by the pathological neurologists, who have held supreme power for about 100 years. Then along came the neuro-psychiatrists, who have been rapidly encroaching upon them for the past 30 years.

Dr. F. R. FORD most successfully defends the stand of the clinical neurologists. Briefly, his book is concerned with the essential clinical features of every neurological disease known to childhood. Precisely and adequately it covers the pathological anatomy, diagnosis and established methods of treatment. Not only does it bring together and digest all available information on this subject, but it includes all conditions which occur in childhood, and not just merely those conditions peculiar to childhood. Then too, it gives the neurological complications of diseases not primarily neurological, together with brief, practical discussions of the general aspects of each disease.

This book is the last and the best of its kind. No pediatrician, general practitioner or neurologist should be without it. The two chapters: "The Examination of the Nervous System," and "Clinical Aspects of the Anatomy and Physiology of the Nervous System," should be accessible to every medical student for use at the bedside.

The author is associate professor of neurology in the Johns Hopkins University School of Medicine.

A DOCTOR-PATIENT SPEAKS

Condition Satisfactory, by SANDOR PUDER, M.D., translated by HILDEGARD NAGEL; 1st American edition, light blue cloth, blue-stamped, 201 pages, no illustrations, no index; New York: Alfred A. Knopf, Inc.: 1937. Price, \$2.00

Dr. PUDER is an internist now practicing in Budapest, Hungary. He is chief of the tuberculosis ward of the National Social Insurance Institute of Hungary, and was graduated from

the University of Pecs in Hungary in 1923. He suffered from appendicitis for two years, the complicating conditions being removed only after three operations, each followed by a long period of illness. The book is well-written, accurate, and extremely interesting. It recounts each sensation he had, each spasm of pain, each mental flight of doubt or fear. THE JOURNAL-LANCET endorses this book.

THOMSON ON THE NOSE & THROAT

Diseases of the Nose & Throat, by Sir SAINT CLAIR THOMSON, M.D., LL.D., and V. E. NEGUS, M.S. (London); new 4th edition, heavy pebbled cloth, gold-stamped, 920 pages plus index, 386 figures, 13 color plates, and 16 radiographic plates; New York & London: The D. Appleton-Century Company, Inc.: 1937. Price, \$14.00.

This book appeared 25 years ago; even in diseases of the nose and throat it is highly interesting to notice the changes in treatment and surgical approach. THOMSON, for instance, now omits the KILLIAN operation for frontal sinus disease as being too dangerous. Diathermy and irradiation had to be brought fully up-to-date (1937). The section on per-oral endoscopy is wholly re-written (by NEGUS). Space given to intubation is curtailed; but tracheotomy is given larger attention. Agranulocytic angina appears for the first time in this edition.

This is a beautiful book, beautifully produced, and magnificently illustrated. There are 386 figures instead of 379, and 16 black & white plates instead of 12. One more color plate has been added. THE JOURNAL-LANCET is pleased to recommend this new 4th edition of an old and standard authority on the nose and throat.

BUSINESS METHODS IN MEDICINE

The Business Side of Medical Practice, by THEODORE WIPRUD, with a foreword by MORRIS FISHBEIN, M.D.; 1st edition, blue buckram, gold-stamped, 169 pages plus index, no illustrations; Philadelphia: The W. B. Saunders Company: 1937. Price, \$2.50.

This excellent handbook is the work of the executive secretary of the Medical Society of Milwaukee County (Wisconsin). It treats of innumerable economic problems, even to the point of including investments. The section on office records is very good; but the rest of the book is by no means inferior. A book like this should be owned by every private practitioner.

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MINNEAPOLIS, MINN., NOVEMBER, 1937

DRUGGISTS' COUNTER-SALE OF DANGEROUS DRUGS

Supplemental to the closing paragraph in the Review of Medicine (JOURNAL-LANCET, August, 1937, p. 357,—barbiturates, etc., the following items should be of interest:

I. A letter from a proprietary firm, considering the subject of dangerous and habit-forming drugs, claimed that during the previous year four hundred and ninety million one-grain tablets of phenobarbital were consumed.

II. Druggists admit that such a drug has an over-the-counter sale much cheaper than other barbiturates carrying a proprietary name; but even at that, the latter products have a very large counter-sale.

III. Concerning other proprietaries sold in this manner, the pharmacists quite frankly admit that due probably to the great notoriety acquired through newspapers and magazines like *Time*, there has been an unusually great demand for a drug which until a few months ago was practically unknown to the trade or the public, i. e., "Prontylin," and "sulfanilamide"; in fact, that the brand bearing the trade-name is called for so freely that the shops are selling it as cheaply as twelve tablets for twenty-five cents.

IV. Newspapers to-day are carrying the gruesome item that in Tulsa, Okla., eight deaths have just been caused through the use of sulfanilamide; and that one manufacturing concern is trying to recall shipments to about three hundred and seventy-five pharmacists.

Even though these recent deaths were not actually due solely to the drug in question, there yet exists the problem cited above. Lately the *Journal A. M. A.* has called attention to some serious reactions from the use of sulfanilamide.*

A. W. S.

KEEPING UP

The smell of iodoform and carbolic acid was once a more certain sign of a doctor's office than the brass plate on the door. Antiseptics have been deodorized and refined. Newer anaesthetics are replacing ether and chloroform. Calomel and quinine, once so common everywhere, are now seldom used north of the Mason and Dixon line, and physics are prescribed with caution.

Osler was frequently accused of being a therapeutic nihilist and only two prescriptions are recalled from his *Practice of Medicine*: one was the acid diarrhea mixture in typhoid, and the other was Fuller's lotion for rheumatic joints; but who uses them now? Like automobile designers whose 1938 models are now being exhibited, the modern physician prides himself on remedies that are more pleasant to use and that are of greater dependability in performance. It's a break-neck pace to keep up, but it's a grand old game and nobody wants to die on third.

A. E. H.

* Telegram from Chicago seems to indicate that the solvent in a syrup of sulfanilamide might be the lethal element.

SUPPLEMENTING PRIVATE PRACTICE

Recently, persons have advocated the extension of medical service at the expense of the taxpayer so as to supplant the private practice of medicine; in other words, provide institutions for cardiacs, arthritics, *etc.*, and employ physicians to care for them. No matter how far this idea is extended, even if it includes all phases of medical care, physicians are the only members of society qualified to give this service. They become qualified after many years in school and much practical experience after graduation. Many of them are already established and rendering splendid service in private practice. Aside from the occasional exception, there is no question as to their ability, skill, honesty, and trustworthiness in every respect. The critics for the most part center their attacks around the cost of medical care. Unfortunately, the proposals the critics offer would be the most costly method of administering medical care. First, institutions have to be provided at the expense of the taxpayer; their maintenance is a large item. The salaries of medical personnel would probably exceed the average income of private physicians in this country.

When one analyzes the cost of medical care on the private practice basis much of the expense to the patient is chargeable to the equipment and materials which the physician must use, such as salvarsan, anti-pneumococcic serum, anti-toxins, insulin, X-rays, and operating room charges. Often these materials are purchased by the physician, and, when added to his bill, they make his fee seem exorbitant. For example, a working girl reported to a physician's office because of soreness of her throat, for which she expected only an office call charge would be made. She was found to have diphtheria, and the cost of the anti-toxin which the physician immediately purchased and administered brought the expense of this service far beyond what she could conceive as justified, since it required all of her savings for several weeks. Another young woman developed Type I lobar pneumonia. The physician's fee for her care seemed exorbitant because approximately one hundred dollars of it was for anti-pneumococcic serum. Similar experiences are frequent among physicians.

It is difficult to see how any advantage whatsoever could accrue from a system at the expense of the taxpayer which would supplant the private practice of medicine, resulting in the loss of the patient's right to select the physician of his choice. However, state and local health departments, through funds derived from the federal government or otherwise, could greatly reduce the cost of medical care by supplementing the practice of medicine without interfering in any way with the freedom and rights of persons requiring such care. Indeed, a considerable amount of this work has already been done; for example, many remember the day when every Wassermann test cost ten dollars or more; when arsenicals and mercury employed in the treatment of syphilis added a good deal to the patient's expense. Now those unable to pay the fees of their physician plus cost of tests, arsenicals, *etc.*, are relieved of the additional expense of tests and drugs by having them provided by

health departments.

Why not extend this service to those who need it so as to have it include all the special and expensive phases of the examination, as well as expensive preparations used in therapy and prevention. This would permit the physician to give the patient the advantage of all that he has been taught regardless of the patient's inadequate financial status; whereas, with the present system an expensive preparation, such as anti-pneumococcic serum, may be withheld because the family may not feel able to afford it. Already great strides have been taken in this direction in some of our states, and, it appears that it is a logical and important step toward the solution of the problem of the cost of medical care.

J. A. M.

CORRESPONDENCE

October 12, 1937.

To the Editors:

In the October issue (1937) of your magazine, an editorial appears entitled *Old Age Assistance—Its Medical Danger*, which seems to imply that the "medical economics" of this salutary provision to the old is a "many-headed monster" and the beast which has throttled the art and science of medicine in some foreign lands" and all this because the doctor is asked to render professional services to these old people at a reduction in fees amounting to 40 per cent, and to assist them in the matter of an increase or not of pension because of disability or want of it.

Another grievance is that "during the depression years, the medical profession of Minnesota . . . accepted a fee schedule 40 per cent lower than current medical fees for the care of the indigent under both S.E.R.A. and F.E.R.A." If he is situated as we are here in Montana he renders these services now either for nothing or what little these people can pay. Would he like that arrangement better? Or does he think these unfortunate people should do without any medical service at all?

The writer implies in his questions that this kind of practices has led to the "downfall of medicine in Europe," and that the "practice of certifying disability . . . has increased the number of sick days per year per employee in Germany from $5\frac{1}{2}$ to 28, and in England from 9 to $12\frac{1}{2}$ " and lowered "medical standards in these countries."

Did it never occur to this editor that we have enough doctors, so that under suitable legislation some might do such administrative work as passing on disabilities altogether, doing no curative work at all? Is it news to this editor that some persons in our country remain at work when really unable to do so? I once attended a young man for a complete transverse fracture of a patella who had remained on the job three days after the accident, and at pick and shovel work in zero temperature, at that. How does the editor know that standards of medical practice has depreciated in those countries he mentions? Why, of course, on just such flimsy evidence as greater loss of time among men too ill properly to be at work.

If editors of medical journals persist in a do-nothing attitude except to growl at governmental interventions while millions of our people are deprived of proper medical service for want of purchasing power, we may expect federal and state provisions not altogether to our liking. It is high time our medical "conservatives" get busy and help the profession in figuring out a sensible arrangement for the distribution of medical service to all our people under a plan both they and we will accept. Such a plan would not attempt to pauperize frugal, honest people attempting to live on too small an income and on the other hand, would not attempt to pauperize the profession by asking them to work for nothing.

B. A. PLACE, M.D.,
Great Falls, Montana.

News Items

Christmas anti-tuberculosis seals will be sent to 10,000 people in or near Butte, Montana, according to reports.

Dr. Roscoe C. Hunt, Fairmont, Minnesota, has opened bids for a \$35,000 two-story, 15-bed hospital which he will erect.

Dr. Willard A. Wright, president of the Lions' Club of Williston, North Dakota, has departed for Edinburgh, Scotland, for post-graduate study.

Dr. Theodore F. Riggs, Pierre, South Dakota, spoke before the Lincoln Parent-Teachers Association at Pierre on October 12, 1937.

Dr. Paul A. Swedenburg, a graduate of the University of Minnesota Medical School in 1931, has associated with Dr. Edwin J. Simons, Swanville, Minnesota.

Dr. Alcibiades Alexander Giroux, a graduate of the University of Montreal Faculty of Medicine in 1908, has moved from Duluth, Minnesota, to Red Lake Falls.

Dr. and Mrs. John B. Simons, of Swanville, Minnesota, left on October 1 for Whitefish, Montana, where Dr. Simons will practice medicine.

Granite Falls, Minnesota, will build an addition to its hospital, and bids are being accepted by Dr. Melvin S. Nelson, of the Granite Falls Hospital Board.

Dr. Greger Elmer Schoofs, of North Branch, Minnesota, has located at 1025 West Broadway in Minneapolis, where he will practice.

Dr. Douglas Leonard Johnson, Cambridge, Minnesota, has moved to Little Falls, where he will associate with Dr. Roman V. Fait.

Bids closed on November 2 for the new \$39,000 Infirmary Building to be erected at San Haven, North Dakota, at the tuberculosis sanatorium.

Dr. Bernard Louis Sinner, a graduate of the St. Louis University School of Medicine in 1933, has located at 402 Black Building in Fargo, North Dakota.

Bids closed on October 20 for the new \$170,000 woman's ward building to be erected at the State Hospital for the Insane at Yankton, South Dakota. Dr. George Sheldon Adams is the medical superintendent.

Dr. Agnes Dunnington Gray Stucke, of Garrison, North Dakota, left on October 17 for Bismarck to visit Dr. Edmund C. Stucke before she sails from New York City on the *S. S. President Pierce* on a world tour.

Dr. Raymond Thomas O'Neill, Minot, North Dakota, has returned to his practice. He has been critically ill following an operation at the Mayo Clinic in Rochester.

Dr. Charles Albert Arneson, Bismarck, North Dakota, spoke on "Syphilis" before the Bismarck Lions' Club on October 4, 1937.

The new \$70,000 Service Building of the Lutheran Deaconess Hospital in Minneapolis is scheduled to open in November.

The committee on venereal diseases of the North Dakota State Medical Association has recommended that every complete physical examination include a Wassermann test, according to reports.

Dr. Francis Edgar Manning, Custer, has been elected president of the South Dakota Health Officers Association. Dr. Will Donahoe, Sioux Falls, is vice-president; and Dr. B. A. Dyar, Pierre, is the secretary-treasurer.

Dr. George Washington Bolkcom, 70, of Minneapolis, died at his home on October 17, 1937. A graduate of the University of Minnesota Medical School in 1894, Dr. Bolkcom was in practice until 1934, when he retired.

A seminar at the Center for Continuation Study at the University of Minnesota, Minneapolis, will be held from November 1 to 6, 1937, on surgical diagnosis and treatment.

The first regular monthly meeting of the Cass County Medical Society (North Dakota) for the fall season was held on October 25 at the Fargo Chamber of Commerce.

Dr. Francis Weldon Ford, a graduate of the Tufts College School of Medicine, Boston, in 1935, has associated with Dr. Frederick Chase Lorenzen in Elgin, North Dakota.

Dr. Ralph St. John Perry, 73, a graduate of the University of Indiana School of Medicine in 1884, died at the Veterans Administration Facility in Minneapolis, where he had been a surgeon, on October 4, 1937.

Dr. Maurice Martin Heffron, of Dickinson, North Dakota, was married on September 25 in Chicago to Miss Maryruth Stephan, of Chicago, and both have returned to Dickinson.

Dr. Otto W. Yoerg, Minneapolis, was installed on October 7, 1937, as president of the Minneapolis Surgical Society. Dr. E. A. Regnier is vice-president; and Dr. Harvey Nelson is the new secretary-treasurer.

Dr. Samuel Saunders Steinberg, of Butte, Montana, has been awarded a diploma from the American Board of Radiology. He is the second physician in Montana to obtain such a certification.

Dr. Clarence E. Sherwood, secretary of the South Dakota State Medical Association, Madison, South Dakota, attended the international assembly of the Interstate Post-Graduate Medical Association at St. Louis, Missouri, on October 18 to 22, 1937.

Dr. Edward Aloysius Welch, clinical director of the Veterans Administration Facility at Hot Springs, South Dakota, delivered an address recently in that city on "Syphilis."

Dr. Carl G. Arvidson, Minneapolis, addressed the American Prison Conference at Philadelphia on October 9, 1937, on "Experiences and Treatment of Venereal Diseases in Minnesota Penal Institutions."

Dr. William P. Ross, for 8 years chief of the Southwestern Minnesota Sanatorium in Worthington, has been named chief of the Otter Tail County Sanatorium near Fergus Falls.

Dr. John Cowan, chief of the division of preventable diseases of the state of North Dakota, spoke on "Communicable Diseases" before the Parent-Teachers Association of Jamestown on October 12, 1937.

Dr. Andrew John Heimark, 57, a graduate of the University of Illinois College of Medicine in 1904, died at Fargo, North Dakota, on September 17, 1937. Dr. Heimark came to Finley, North Dakota, in 1904, remaining there until 1924, when he removed to Fargo.

Dr. Irvin L. Schuchardt, a graduate of Rush Medical College of the University of Chicago in 1935, has located with Doctors M. Robert Gelber and Dr. Gregory P. Donovan in the Citizens Building in Aberdeen, South Dakota.

Dr. Amos Roy Gilsdorf, a graduate of the University of Minnesota Medical School, has completed his internship at the Minneapolis General Hospital, and has associated with the Dickinson Clinic in Dickinson, North Dakota.

Dr. William M. Copenhagen, Jr., a graduate of the University of Minnesota Medical School in 1932, who had been studying at the New York Post-Graduate Medical School & Hospital since 1935, has located in the Power Block at Helena, Montana.

There are now no less than 115,000 members in the Minnesota Hospital Service Association, according to Mr. E. A. van Steenwyk, secretary of the organization. Liaison arrangements have been established with the American Hospital Association.

Dr. Arne O. Arneson, McVile, North Dakota, was tendered a program in honor of his more than 30 years of service in North Dakota, on October 3, 1937. He was graduated from George Washington University School of Medicine, Washington, D. C., in 1911.

Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota Medical School, spoke on "Health Hygiene" at the State Teachers College, St. Cloud, on October 11, 1937.

Dr. Harold William Gregg, of the Murray Hospital Clinic, spoke on "Lymphatic and Monocytic Leukemia" at the monthly meeting of the Silver Bow County Medical Society at the Silver Bow Club in Butte, Montana, on October 5, 1937.

Dr. Guy E. Van Demark, Sioux Falls, South Dakota, described methods in orthopedic surgery and correction before a meeting of the Altrusa Club in Sioux Falls on October 7, 1937. Dr. Goldie Eleonora Zimmerman, an Altrusa Club member, was also on the program.

Dr. Thomas L. Hawkins, of Helena, secretary of the Medical Association of Montana, visited the international medical assembly of the Interstate Post-Graduate Medical Association at St. Louis, Missouri, on October 18 to 22, 1937. From St. Louis, Secretary Hawkins went to Chicago, where he attended the meeting of the American College of Surgeons.

Dr. Frank Terrill, superintendent of the Montana State Tuberculosis Sanatorium at Galen, has departed for Chicago, where he will enter the American College of Surgeons, and take post-graduate work at Cook County Hospital.

Dr. Henry F. Helmholtz, Rochester, professor of pediatrics in the University of Minnesota Graduate School of Medicine, has been named president of the International Congress of Pediatricians, which met at Rome, Italy, in September.

Dr. James W. Vidal, 76, a graduate of the University of Michigan Homeopathic Medical School in 1882, died at Fargo, North Dakota, on October 5, 1937. He owned a hospital in Fargo, and was a member of the National Homeopathic Society.

Dr. Clifford Earl Waldorf, a graduate of the Northwestern University Medical School in 1918, formerly a physician at the State School and Home for Feeble-Minded, at Redfield, South Dakota, has entered practice on the first floor of the Friedman Apartment Building in Redfield.

Dr. William Gerard Paradis, superintendent of Sunnyst Sanatorium at Crookston, Minnesota, will not resign on November 1, as has been announced elsewhere. Sanatorium commissioners voted to increase his salary \$300 annually, and Dr. Paradis has accepted this arrangement.

Dr. Joseph Lorin Mondloch, Butte, Montana, conducted a tour of the Butte Anti-Tuberculosis Association through Silver Bow County Hospital on October 14, 1937. The Association held a business meeting, presided over by Dr. Curtis L. Wilson, of Butte.

Dr. Charles Otis Wilkins, 65, of Keokuk, Iowa, died in Winner, South Dakota, on October 12, 1937. A graduate of the old Keokuk College of Physicians and Surgeons in 1906, Dr. Wilkins had practiced medicine at the Rosebud Indian Agency, Hamill, South Dakota, until 1934, in which year he returned to Keokuk.

Dr. Owen H. Wangenstein, chief of the departments of surgery in the University of Minnesota and University Hospital, spoke before the Redwood-Brown Counties Medical Society and the Blue Earth County Medical Society at a joint meeting on September 26, 1937, on "The Traumatic Surgical Abdomen."

Dr. J. C. McKinley, chief of the department of medicine in the University of Minnesota Medical School, and president of the Minnesota Pathological Society, delivered his "President's Address" before the society in the Institute of Anatomy in Minneapolis on October 19, 1937.

Dr. Patrick Henry Mee, 60, of Osseo, Minnesota, died on October 2, 1937, at his home. He was graduated from the University of Minnesota Medical School in 1903, was Sibley County coroner for 8 years, and moved to Osseo in 1911. He was a member of the Hennepin County Medical Society, and other groups.

Dr. Cyrus O. Hansen, instructor in medicine in the University of Minnesota Medical School, was the speaker at the dinner meeting of the Seventh District Medical Society at Sioux Falls, South Dakota, on October 12, 1937. He discussed "Recent Advances in X-Ray Treatment."

Dr. Raymond F. Peterson, of the Murray Hospital Clinic, Butte, Montana, spoke on "Cancer" in the Butte High School auditorium on October 8, 1937, his address being sponsored by the Silver Bow County Medical Society and the bureau of safety of the Anaconda Copper Mining Company.

Dr. Robert D. Mussey, Rochester, professor of obstetrics in the University of Minnesota Graduate School of Medicine, was chosen president of the Central Association of Obstetricians and Gynecologists at Dallas, Texas, during October. The 1938 session will be held in Minneapolis.

Three Minneapolis physicians participated in the 42nd annual convention of the American Academy of Ophthalmology & Otolaryngology held in Chicago during October. They are: Dr. Horace Newhart, professor and director of the department of otology, rhinology, and laryngology in the University of Minnesota Medical School; Dr. Lawrence R. Boies, instructor in the same department; and Dr. Erling W. Hansen, who is secretary of the Academy's public relations committee.

Dr. Gaylord W. Anderson, professor and new chief of the department of preventive medicine and public health in the University of Minnesota Medical School, spoke on "The Present Status of Scarlet Fever Prevention," before the 66th annual meeting of the American Public Health Association in New York City in October. Dr. Max Seham, associate professor of pediatrics, spoke on "The Screening of Behavior Disorders in School Children."

Two junior medical officerships are available to those physicians who pass the examinations and whose credentials are in order. The first is a rotating internshipship at \$2,000 annually at St. Elizabeth's Hospital in Washington, D. C.; the second is a psychiatric residency in the same hospital at the same salary. Applications must be on file with the United States Civil Service Commission in Washington, D. C., not later than November 29. Information may be had from any 1st or 2nd class post-office near the applicant.

Western Reserve University School of Medicine in Cleveland, Ohio, announces a series of graduate courses in various aspects of venereal disease control, under authority of the United States Public Health Service and the Ohio State Department of Health. They are open without fees to physicians in Minnesota, Wisconsin, and North and South Dakota. Physicians should address C. C. Applewhite, M.D., regional consultant of the U. S. Public Health Service, Room 314, United States Court House, Chicago, Illinois.

Dr. Henry L. Ulrich, professor of medicine in the University of Minnesota Medical School, was installed as president of the Hennepin County Medical School on October 4, 1937. Dr. Norman P. Johnson, assistant in medicine at the University, became 1st vice-president; Frank C. Rodda, clinical professor of pediatrics, is the 2nd vice-president; and Dr. Orwood J. Campbell, assistant professor of surgery, is the new secretary-treasurer.

Dr. James M. Hayes, Minneapolis, assistant professor of surgery in the University of Minnesota Medical School, was elected president of the Alumni Association of the Mayo Foundation at the 19th annual session of the association at Rochester on October 22, 1937. Dr. Julius H. P. Gauss, of Indianapolis, assistant professor of medicine in the University of Indiana Medical School, was elected vice-president; Dr. George Vincent Lynch, Oshkosh, Wisconsin, was chosen second vice-president; Dr. J. Richards Aurelius, St. Paul, instructor in radiology in the University of Minnesota Medical School, was chosen secretary; and Dr. Louis E. Prickman, Rochester, assistant professor of medicine in the University of Minnesota Graduate School of Medicine, was elected treasurer.

MISCELLANEOUS

TO MEMBERS OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

Inquiry has been made to the officials of the State Medical Association from members in various parts of the State if any offer had been made to the Board of Administration by the Association to help them solve the problem they had at the State Hospital in Jamestown.

In order that the profession throughout the State might know what was done, this brief statement of facts is made:

September 15th, a telephone request came from Governor Langer that the Board of Administration was in session and requested that the Medical Association name a Committee on whom they might call when necessary to assist in solving problems in connection with the State Hospital, and to send the names of said Committee to the Chairman of the Board of Administration at once. The telephone was used to consult Association officials and the following Committee selected:

Doctors— E. L. Goss, President, Carrington.
J. E. Countryman, Grafton.
R. D. Campbell, Grand Forks.
W. H. Long, Fargo.
N. O. Ramstad, Bismarck.
M. W. Roan, Bismarck.
F. C. Lorenzen, Elgin.
F. W. Fergusson, Kulm.

This list was sent Day Letter September 15th to Mrs. Jennie Ulrud, Chairman, State Board of Administration, and Governor Langer. Acknowledgement of receipt of this Day Letter has not been received nor has this Committee been asked to serve in any capacity.



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Fifty-Ninth Annual Meeting of the Medical Association of Montana--Great Falls, July 13 and 14, 1937

OFFICERS, 1937-1938

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ALTERNATE

E. M. GANS, M.D. Harlowton

COUNCILORS

	Term Expires
J. I. WERNHAM, M.D., Billings	1938
E. D. HITCHCOCK, M.D., Great Falls	1938
E. S. MURPHY, M.D., Missoula	1938
M. SMETTERS, M.D., Butte	1938
A. D. BREWER, M.D., Bozeman	1939
J. H. GARBERSON, M.D., Miles City	1939
E. A. WELDEN, M.D., Lewistown	1939
L. G. DUNLAP, M.D., Anaconda	1940
E. N. JONES, M.D., Wolf Point	1940
L. T. SUSSEX, M.D., Havre	1940

ANNUAL MEETING OF THE COUNCIL OF THE MEDICAL ASSOCIATION OF MONTANA

July 13, 1937 — Rainbow Hotel

Great Falls, Montana

Those present were: Doctors, President John A. Evert, E. S. Murphy, E. N. Jones, E. D. Hitchcock, L. P. Sussex, E. A. Welden, A. D. Brewer and T. L. Hawkins.

Due to the necessary departure of the president, Doctor E. S. Murphy was selected as chairman of the meeting.

The finance report of the Association was read, which included the auditing of the books by H. B. Godfrey of Billings, Montana, following the death of Doctor E. G. Balsam, secretary-treasurer. The secretary, Doctor T. L. Hawkins, asked for advice concerning the investment of funds. The councilors granted the secretary-treasurer permission to use his own discretion in the investment of funds for the Association.

A discussion of the reduction of members of the Council was held. Doctor A. D. Brewer moved that a motion for the reduction of the number be tabled, which was seconded by Doctor E. A. Welden. A motion was made to that effect and put to a vote and carried.

It was moved by Doctor L. P. Sussex and seconded by Doctor E. A. Welden that Doctor John A. Evert and the secretary-treasurer act as a committee to arrange for an official journal for the Association. The motion carried.

A statement of the orthopedic division of the Welfare Board, as to its policy, was read and adopted with corrections.

There being no further business the Council adjourned.

59th ANNUAL MEETING OF THE HOUSE OF DELEGATES OF THE MEDICAL ASSOCIATION OF MONTANA July 13, 1937

The meeting of the House of Delegates was called to order by the president, Doctor John A. Evert, on July 13, 1937, at the Rainbow Hotel, Great Falls, Montana.

The certificates of the delegates from the various counties were examined and found to be in order.

It was moved and seconded that the minutes of the last meeting be dispensed with. The motion carried. The secretary-treasurer's report was read.

Doctor S. A. Cooney reported on the Bozeman case, and cited the significance of the Supreme Court's decision.

A communication from the State Welfare Board, relative to the case of Mae Bell, an indigent, was discussed. A motion was made, seconded and passed to communicate with the State Welfare Board and inform them that the Medical Association did not qualify a physician over and above the certification to practice in the State of Montana and since the county physician is a licensed physician, he is competent to act.

A committee consisting of Doctors H. W. Gregg, A. D. Brewer and J. H. Graham was appointed to prepare a memorial to the late Doctor H. A. Bolton and Doctor Elmer G. Balsam. The resolution as adopted:

"Whereas, during the past year, two very prominent and much loved members of our Society, namely Doctor Harris A. Bolton of Warm Springs and Doctor Elmer G. Balsam of Billings have finished their work, and have slipped away into the unknown.

"Be it resolved, that the House of Delegates have assembled, pause to remember their kindness and friendship.

"Be it further resolved, that we remember with gratitude the fact that the practice of medicine in Montana is better and our lives are richer because these men lived and practiced among us.

"Be it further resolved, that there be a permanent record of the lives and work of these men and such a record be made a part of the activities of our Society.

"Be it further resolved, that a copy of these resolutions be spread upon the minutes of this meeting, and that another copy be sent to the families of the men."

Doctor S. A. Cooney stated that the Medical Examining Board now requires citizenship as a pre-requisite in obtaining a license to practice in the State of Montana.

Doctor H. W. Gregg reported on a nurses' strike in Anaconda. Doctor A. J. Willits made further comment on the Anaconda situation. Doctor H. W. Gregg was

appointed chairman of a committee to report on what action the Medical Association should take in this matter.

Doctor J. C. MacGregor reported on the work of the Medical Defense Committee and stated that the number of malpractice cases had dropped from over fifty to fifteen since the committee had functioned.

Mrs. Keck, national representative of the Women's Auxiliary, spoke to the delegates and asked permission to grant the formation of such an auxiliary to the Montana Medical Association. Doctors J. R. E. Sievers, J. H. Irwin and F. L. McPhail were appointed on a committee to investigate this organization, and report back to the House of Delegates on July 14, 1937.

Doctor J. H. Irwin gave a report as a delegate to the American Medical Association.

A committee consisting of Doctors E. S. Murphy, F. R. Schemm and C. H. Peterson was appointed to select five names for two vacancies on the State Board of Health. The first vacancy created by the death of Doctor E. G. Balsam and the second vacancy to occur shortly at the expiration of the term of Doctor B. E. Pampel.

Doctor S. A. Cooney, representing the Lewis and Clark County Medical Society, presented a resolution from the society, requesting that the annual meeting of the Association be held in the spring of the year. Doctors H. W. Gregg, S. A. Cooney and J. H. Irwin were appointed on a committee to report back and make recommendations for the change in date of the meeting for 1938.

A motion was made, seconded and carried that Mr. E. G. Toomey of Helena be retained as attorney for the association and that his retaining fee be arranged by mutual agreement with the secretary-treasurer of the Association.

Doctor E. S. Murphy spoke on a registration fee for all who practice the healing art in Montana.

A motion was made, seconded and passed that the Legislative Committee meet with Mr. Toomey and report at the next meeting.

Doctor W. P. Smith spoke on a formation of an Inter-Relations Committee on Scientific Papers, and a motion was made, seconded and passed that such a committee be appointed.

A motion was made, seconded and passed that the name of the Committee on Infant Welfare be changed to the Committee on Maternal and Child Health.

A motion was made, seconded and passed that the problem of birth control was one of individual judgment and that it was not a matter to be acted upon by the Medical Association of Montana.

A motion was made, seconded and passed that a committee be appointed on tuberculosis.

A motion was made, seconded and passed that a committee known as the "Fracture Committee" be organized.

A motion was made, seconded and passed that the Committee on "Periodic Health Examination," "Veteran's Affairs," and "Universities," be stricken from the list of committees.

It was moved and seconded that a committee be appointed to be known as the "Committee for the Revision of the Constitution and By-Laws." This motion was passed.

A committee on resolutions was appointed consisting of Doctors L. H. Fligman, F. L. Andrews and C. H. Nelson.

There being no further business the House of Delegates adjourned.

HOUSE OF DELEGATES

July 14, 1937

A Meeting of the House of Delegates of the Medical Association of Montana, held July 14, 1937, at the Heisey Memorial Building, Great Falls, Montana.

After the proper certifying of the delegates, the House was called to order by President John A. Evert.

The resolution committee made the following report: "We, the Committee on Resolutions, having met, desire to present the following resolutions:

1. Resolved that we extend to the following organizations our sincere appreciation for their assistance in making this meeting a successful one.

First, to the Cascade Medical Society, for the efficient manner in which they have contributed towards making this meeting a pleasant and profitable one.

Second, to the Great Falls *Tribune* and *Leader*, for their generous space donated in their press.

Third, to the Rainbow Hotel, for donating space for exhibits and for its hospitality."

The Women's Auxiliary Committee reported that they recommended that the Association grant authority for the formation of a Women's Auxiliary to the Medical Association of Montana. Such a motion was made, seconded and passed by the House of Delegates.

A committee appointed to select a list of five names for presentation to the governor for the two vacancies on the State Board of Health, reported and submitted the following names: B. E. Pampel, Chas. S. Houtz, J. I. Wernham, B. E. Smetters, and E. N. Jones.

A motion was made, seconded and carried recommending a permanent record of the lives of the members of the Association be kept in the secretary's office.

Doctor J. H. Bridenbaugh made a report of the Cancer Committee and the monies spent by such committee during the past year. A motion was made, seconded and passed accepting the report of Doctor J. H. Bridenbaugh.

A committee appointed on July 13th reported and recommended that a letter be written to the National and State Nurses Association commending them on their action in disqualifying striking nurses in their organization.

A committee appointed to study a change of time of the state meeting reported as follows:

"Your Committee recommends that beginning in 1938, our society have two annual meetings, namely as follows: One business meeting late in April at some central point of the House of Delegates and the Councilors. This

meeting should require one day.

"The second, a scientific meeting to be held in November to last two days.

"That a permanent program committee be appointed by the Chair at this present meeting. That this committee be composed of three men and the secretary, who is to be an *ex officio* member. That one man on the committee be appointed for three years, one for two years, and one for one year, thus one new member will be appointed each year. This would insure continuity in the work of the committee.

"That the delegate to the American Medical Association be given a place on the scientific program.

"As an alternative, if the men feel that they do not want two meetings a year, that a meeting comparable to our present meeting be held in April of each year, but in that case, there still be appointed the above mentioned permanent program committee."

A motion was made, seconded and passed that two meetings be held each year. The first meeting a business meeting, consisting of the officers, councilors and House of Delegates. This meeting to last for one day and to be purely a business meeting. A second meeting to be a scientific meeting and to be held in the fall and to last for two days and at which meeting no business will be transacted.

Doctor E. A. Welden invited the Association to meet at Lewistown in 1938. Doctor J. C. Shields moved that the invitation be accepted. The motion was seconded and passed.

Doctor H. W. Gregg nominated to the office of president-elect, Doctor J. C. MacGregor of Great Falls. Doctor J. J. Kaulbach seconded the nomination and moved that the nominations be closed and that the secretary be instructed to cast an unanimous ballot for the election of Doctor J. C. MacGregor. The motion was carried.

Doctor J. R. E. Sievers nominated Doctor E. D. Hitchcock for vice-president. Doctor J. I. Wernham moved that the nominations be closed. The motion was seconded and passed and the secretary was instructed to cast an unanimous ballot for Doctor E. D. Hitchcock for vice-president.

Doctor F. L. Andrews nominated Doctor T. L. Hawkins for secretary-treasurer. Doctor J. C. Shields moved that the nominations be closed. The motion was seconded and passed and the secretary was instructed to cast an unanimous ballot for Doctor T. L. Hawkins for secretary-treasurer.

Doctors E. N. Jones, L. T. Sussex and L. P. Dunlap were elected as councilors for three year term. Doctor J. I. Wernham was elected councilor to fill out the unexpired term made by the vacancy of Doctor T. L. Hawkins.

Doctor J. H. Irwin was elected delegate to the American Medical Association meeting with Doctor E. N. Gans as alternate.

There being no further business the House of Delegates adjourned.

THOMAS L. HAWKINS, M.D.,
Secretary-Treasurer.

Some of the Problems in the Diagnosis of Intestinal Obstruction*

Kent E. Darrow, M.D.†

Fargo, North Dakota

INTESTINAL OBSTRUCTION, or ileus, is always a secondary disease caused by some antecedent condition which produces a stoppage of the bowels. This primary cause may be mechanical, causing mechanical obstruction, or it may be toxic or nervous, causing a paralysis of the bowel, which is known as paralytic ileus. An obstruction can also be caused by a spasm so severe as to close the lumen of the bowels and is known as dynamic ileus. Mechanical obstruction occurs through all grades of partial obstruction up to a complete one, in which no gas or fecal content can pass the obstructed point.

Besides obstructing the lumen of the gut, the circulation may also be shut off, either the arterial or the venous, or both, and we then have strangulation as well as obstruction. While we generally mean gross obstruction of the vessels when we speak of strangulation, nevertheless, nearly every case of obstruction, if it persists long enough, shows marked impairment of the capillary circulation due to the distention of the bowels; and this is undoubtedly an important factor in the fatal outcome of the obstruction. Complete obstruction unrelieved is a fatal disease; but much more rapidly so if strangulation is added.

It might be mentioned here that strangulation of a portion of the intestinal tract will occur with thrombosis or embolism in the mesenteric vessels. The bowel becomes gangrenous and paralysis follows which in turn produces obstruction. A partial obstruction may be present for a long time. When it becomes complete, we then immediately have an acute obstruction.

A list of the primary causes of obstruction must always be kept in mind if one is to diagnose this bizarre condition.

Some of the external mechanical causes are:

- Herniation through external or internal openings.
- Volvulus.
- Peritoneal bands, congenital or acquired, which either kink or constrict the gut.
- Neoplasms constricting the intestinal wall.
- Ulcerations with cicatricial constriction. Tuberculosis, syphilis or colitis.

Internal causes:

- Intussusception.
- Foreign bodies, gall-stones, enteroliths, swallowed foreign bodies.

Neoplasms filling the lumen and diverticuli.

Causes which produce paralysis:

- Adynamic or paralytic ileus.
- Nervous origin, cord lesions, trauma to the abdomen and psychic trauma.
- Infectious or toxic origin—peritonitis, pneumonia, acute hydronephrosis.
- Circulatory origin, thrombosis and embolism.
- Dynamic ileus, lead poisoning.

Symptomatology

With all the above different factors as the cause of obstruction, there can be no single picture to cover this tragic condition. The textbooks picture a fairly constant set of symptoms and physical signs quite characteristic of obstruction. They are directly due to the closure of the lumen of the gut, but must vary somewhat with the suddenness of the closure and the site of the closure in the intestinal tract. As a rule, the nearer the stomach the obstruction occurs, the more rapid the symptoms will appear, the more severe they will be, and the more toxic the patient. The presence of strangulation also makes the symptoms more severe and the patient more toxic.

The outstanding symptoms are first pain, then nausea, followed by vomiting, and later, stoppage of the stools with abdominal distention and generalized toxemia with rapid feeble pulse, and prostration. The patient is usually mentally clear with little or no elevation of temperature or increased leukocyte count unless there is gangrene of the bowel or peritonitis.

The physical signs are anxious facial expression, doubled-up posture, distended abdomen, tympany, sometimes with fluid and later with visible peristalsis and borborygmi in mechanical obstruction; but complete absence of visible peristalsis and borborygmi in the paralytic type. If the obstruction has lasted some time there is marked dehydration of the subcutaneous tissues easily visible to the eye.

Pain is probably the most characteristic symptoms of obstruction, varying from mild to the most excruciating. The variation in the pain seems to be due, at least in part, to the suddenness of the onset and the completeness of the obstruction and the amount of circulatory disturbance.

The pain may be localized at the point of obstruction, but more often is generalized, resulting from the hyperperistalsis. If there is anything characteristic about the pain, it is that it is apt to be intermittent or paroxysmal due to the intermittent contractions of the bowel

* Presented before the annual meeting of the North Dakota State Medical Association, held at Grand Forks, May 16-18, 1937.

† Dakota Clinic, Fargo, North Dakota.

attempting to force the intestinal content beyond the obstructed point. As the bowel distends and paralysis approaches the pain becomes less severe, more generalized, and more constant. A stage is sometimes reached when there is little or no pain. This is apt to give a false sense of security. The pain usually returns and is even more severe and paroxysmal. In paralytic ileus without peritonitis pain may be practically absent. This is due to the lack of peristalsis.

Many abdominal conditions have very similar pain—acute appendicitis, acute pancreatitis, ruptured ulcer, ruptured ectopic, acute pelvic peritonitis, acute hydro-nephrosis or kidney stone and even gall-stones. Any of these conditions may cause considerable bowel disturbance of an obstructing nature which produces more or less paralytic ileus.

Nevertheless, the pain in intestinal obstruction with its varying intensity and site, when considered with other symptoms and physical findings is an important link in the chain of evidence leading to the correct diagnosis.

Nausea and vomiting: Nausea is nearly always present at the very beginning, and usually continues throughout the course. Often, however, one sees the patient vomiting nearly continuously without feeling "sick at the stomach."

Vomiting also starts early; at first only stomach contents, but later bile and upper intestinal contents, and still later, the vomitus is fecal in character.

At first, the vomiting is intermittent and in large amounts; later, it is almost continuous and in small amounts with occasional violent expulsion of large amounts of black, foul, fecal-like fluid. Stomach lavage only gives a little temporary relief. Continuous suction drainage is much better. It is this great loss of fluids and the important glandular secretions of the upper intestinal tract that are the greatest factors in the severe toxemia.

Constipation: Do not be misled by the return of colon content with the first enema or two after the onset of the symptoms. Blood and mucous should make one think of intussusception in children, and cancer in older people.

Without a lot of clinical experience, one should not put too much reliance on the passage or absence of stools. Several stools may be passed in the presence of acute obstruction and serious constipation, or even obstipation, may be present in many abdominal and systemic diseases without obstruction.

Abdominal distention: Abdominal distention is not characteristic at first. As the disease progresses, the abdomen is usually uniformly enlarged with some protrusion about the umbilicus and epigastric regions. Sometimes coils of distended bowels or stomach may be seen together with active peristalsis. The distention is greatest in paralytic ileus, but is also extreme in many of the obstructions of the lower colon and sigmoid. The dis-

tention following serious abdominal operations is often difficult to distinguish from true obstruction.

Physical examination: At first, there are no signs except the picture of the suffering, pinched face, the patient usually lying on the back with the knees doubled up. Then the distention begins, and visible peristalsis may be seen.

Palpation: There is a sense of overdistention of the stomach and intestines. Tenderness is rarely present and the reflex spasm of peritonitis is usually absent. Unless a cancer or tumor of long standing is the cause of the obstruction, usually no masses can be felt. Intussusception may be an exception. Hernial openings are palpated for hernias caught in the rings. Rectal examination may show a low-lying cancer or the stricture of an advancing intussusception. Fluid may be sometimes made out in the abdomen. If perforation has taken place, an abscess may be localized.

Percussion: As obstruction advances, general tympanites can be made out on percussion. Local tympany might suggest a volvulus. An area of dullness in a child might suggest intussusception. In advanced life it would suggest cancer.

Auscultation: Auscultation is most valuable in determining active peristalsis. Gas can be heard gurgling along the intestinal tract, particularly in mechanical obstruction; but it is absent in paralytic types or late in the mechanical type after the bowel has become paralyzed.

Other valuable signs are a pulse which becomes faster and faster, but weaker and weaker. The temperature remains normal without such complications as peritonitis, strangulation or perforation.

Laboratory findings: The leukocyte count remains normal in the absence of inflammation or strangulation. The red blood count may be increased if there is much dehydration. The non-protein nitrogen in the blood is increased due to the loss of chlorides from vomiting. The carbon dioxide combining power is increased.

The X-ray may be used, but does not add a great deal of information. A flat plate of the abdomen may show the fairly typical step-ladder appearance, which some consider quite characteristic of intestinal obstruction. Barium by mouth is quite dangerous, and should practically never be given this way in obstruction. Many object to its being given in pyloric stenosis in infants. In very high obstructions the barium will be vomited and can not cause the harm that it would in obstruction of the large bowel. Barium enemas, however, are permissible and give valuable information in obstructions of the large bowel.

Proctoscopic examination will give similar information.

The progress of the disease from onset shows a great variation. An average duration might be placed between four and five days. High obstructions develop much more rapidly and are fatal much quicker than obstruc-

tions lower in the bowels. An obstruction in the sigmoid without strangulation might last several weeks before it is fatal. With strangulation present, the constitutional symptoms develop very rapidly and the local symptoms may be exaggerated.

From the foregoing description of obstruction with its many causes, one at once realizes the importance of a most careful and complete history of the patient, his previous illness, operations, accidents, *etc.*, and a careful history of the sequence of the present trouble.

Before going into the diagnosis, a few case histories will be cited to show some of the varieties of obstruction and the problems to be met.

Case I.

Baby C., female, born June 17, wt. 3350 gm., apparently normal except that the right eye lid is innervated by same nerve as the superior rectus. The fourth day she began to vomit all fluids taken, and showed dehydration. No fever. On the fifth day, X-ray with barium meal showed an obstruction near the distal end of the duodenum. The baby was prepared by fluids, and explored that evening under local block. The duodenum was found markedly distended, and a 360 degree volvulus of the entire mesentery of the small intestines was found at the jejunum where it comes from behind the peritoneum. This was untwisted and a few bands about the jejunum were cut. The obstruction was thus completely relieved. She made a good recovery.

Case II.

E. M. C., female, age six months, admitted to hospital 4:30 P. M. She was a normal baby, and had been perfectly well up to the day before admission. She began vomiting at 5 A. M. the day of admission. She had no desire to nurse, and no stool the day before. An enema the day of admission produced a good stool and she had two bowel movements since, but only blood and mucus. She vomited everything taken. T. 101, P. 130, R. 30.

Physical examination was mostly negative except for a suggestive mass in the right lower quadrant. No pain occurred on palpation. A mass was felt by rectal examination near the left midline. It was not firm or ballooned out. The barium enema could not be forced beyond the sigmoid. Urinalysis was negative except for acetone. White blood count, 16,100. Diagnosis: Intussusception. Operation under ethylene at 5:30 P. M. the same day. Intussusception of about six inches of ileum into the cecum. This was reduced, and a gangrenous appendix was noted after reduction. This was removed. She made a good recovery.

Case III.

F. M., male, age 22, admitted to the hospital 11:15 P. M. He began 36 hours before to have generalized abdominal cramps and vomiting. The vomiting continued, and the pains became colicky and intermittent. He had no stool for 48 hours; also there was no gas. He had a history of operation for ruptured appendix

five years before. Since operation he has had three definite attacks of cramps and vomiting and many minor spells of gas.

Physical examination was negative except the abdomen. T. 98, P. 70, R. 20. General distention was found but no masses and no especial tenderness. The abdomen was rigid especially during cramps. Peristalsis could be seen and gas sounds could be heard all over the abdomen. Rectal examination was negative, but fecal matter could be felt in the rectum. Urinalysis was negative. White blood count, 5,500.

A diagnosis of obstruction was made and immediate operation at 12:52 A. M. was done under spinal anesthesia. At operation a band that might have been a rudimentary Meckel's diverticulum was found obstructing the ileum. This was cut and an ileostomy tube put in. Recovery was uneventful.

Case IV.

N. J. K., female, age 52, admitted to the hospital at 10:15 A. M. Pain throughout the abdomen and vomiting began at 7 P. M. the night before. Pain was cramp-like and intermittent. She had had two abdominal operations, and gave a history of similar attacks two years ago and another one a year ago. Lighter attacks occurred in between.

Physical examination showed generalized distention, marked tympanites, and gas sounds throughout the abdomen. Rectal and pelvic examinations were negative. T. 98, P. 80, R. 20, white blood count, 8,650 on admission; 7,100 that evening, and 5,800 the next morning.

A diagnosis of obstruction or partial obstruction was made. The surgeon's note was that suction might be tried, together with enemas and glucose and concentrated salt solution by vein. If the pulse increased immediate operation was advised, otherwise observation seemed best. The medical consultant made the same notations.

The patient was put on continuous hot stupes, duodenal suction, intravenous glucose and salines, and enemas. Enemas got results that morning and the patient continued to improve. She left the hospital the fifth day feeling well. This patient will probably come to operation some time.

Case V.

Mr. A. P., age 49, was admitted to the hospital on March 29, 1931. He was well up to that time. He had severe pain two days before while doing chores. They were on left side of the abdomen and radiated to the inguinal ring and up into the left upper abdomen opposite the kidney with occasional pain in the left kidney region. He had a frequent desire to void, but passed only a few drops and that with burning. He vomited a little, and the pain left in about two hours. He had some burning on urination the next day, but ate a general diet without distress. Pain began again that evening in the left side. He had the same dysuria and desire to void. He had no bowel movements since the

first attack, but passed a little gas at one time. Pain continued all night and the patient was brought to the hospital the next day. There was no history of similar trouble or of operations.

Physical examination was negative except for the abdomen. Marked general distention and tympanites was found with marked rigidity throughout the abdomen. No localized tenderness was found. Rectal examination was negative. Tenderness was found in the left kidney region. T. 99.2, P. 84, R. 22. Urinalysis showed a few white blood cells. White blood cell count, 10,000. 27 mg. urea nitrogen per 100 cc. of blood. X-ray films of the abdomen were negative except for distended intestines.

Diagnosis: Kidney lesion with ileus (?) obstruction? Cystoscopy was done. Both ureteral orifices secreted normally, the right more than the left. Catheters could not be passed on either side, but indigo carmine was secreted freely on both sides, more on the right than the left. Exploration was then advised.

Spinal anesthesia was given and when the anesthetic had reached the nipple line, the bowels commenced to run off and distention decreased. An enema was given, and a great deal more was returned than was given with many particles of fecal matter. He was returned to bed without exploration. He felt better for a while, but began to bloat up again, and had considerable distress. A little gas passed at times with enemas but no stool. The distention increased and two days later, in spite of medical opinion that the kidney was undoubtedly to blame, he was taken to the surgery and explored. The spinal anesthesia did not relieve him this time.

No obstruction could be found at exploration, but a horseshoe kidney was palpated with considerable distention of the left kidney pelvis. With medical treatment, hot stupes, intravenous glucose and concentrated salt and continuous duodenal suction, he made a good recovery in spite of the exploration. He did not return for further kidney studies.

Case VI.

Mr. E. D. A., age 80, was admitted to the hospital at 5:00 P. M. Vomiting began at about 10:00 P. M. the night before and continued. There was no fecal odor. Four enemas produced no results. No severe abdominal pain occurred but a continuous diffuse abdominal distress, not paroxysmal, was present. The abdomen was tender and sore. There was no history of bowel trouble or operations. Slight diarrhea occurred a week ago.

Physical examination: T. 98.6, P. 100, R. 18, B. P. 150/90. Generalized distention was found with more tympany in the upper abdomen. Tenderness was moderate in the right upper and left lower abdomen. Rectal examination was negative. White blood cell count on admission was 11,500, and the next morning 29,500.

The surgeon's note that evening stated that the abdomen was greatly distended; but not especially tender. No masses were made out. No hernia was felt. The abdomen was quiet, with no gurgles heard anywhere.

There must be obstruction without gangrene; he does not look toxic; can wait until A. M. A medical note made about the same time stated: "More distention tonight; stomach washed, small amount of bile-like fluid obtained, no fecal odor. Explore in A. M."

He did not vomit during the night, but at 10:00 A. M. he had fecal vomiting, and this was just 36 hours from the first time he vomited. He was taken to the operating room, but died before he could be explored. Autopsy showed a volvulus of a piece of small intestine high up in the jejunum with complete gangrene of the bowel. Immediate operation might have saved this patient in spite of his age.

Case VII.

Miss N. H., age 29, admitted April 13, 1937, and operated the next day. A large submucous fibroid was removed without hysterectomy and the wound was closed without drainage. Moderate fever reaction occurred the second postoperative day. The pulse was about 100, but the respiration was unaffected. More pain than usual occurred. A little vomiting was noted but not more than in many cases. The enema on the third day returned with a large amount of flatus and formed stool with some relief. Considerable nausea and vomiting and lots of gas pains occurred on the fourth postoperative day. Enemas again brought much gas and some fecal matter. On the fifth postoperative day there was still pain and more bloating. Enemas still brought gas and fecal matter with some relief. Stomach lavage returned a moderate amount of greenish yellow fluid. More vomiting occurred. Duodenal suction was started. Temperature was up to 100°, pulse 100 to 110. Sixth postoperative day found marked distention. Morphine gave very little relief from pain. Enemas returned with a large amount of gas and some fecal matter. Rectal examination was negative, no bulging was found in the cul-de-sac, but there was some tenderness. The temperature went up to 102° that night; the pulse, 110. On the morning of the seventh postoperative day, the patient said she felt better. Her temperature was 100, pulse 100 to 110, respirations normal. White blood cell count, 12,500. The X-ray showed marked distention of the small intestines. No gas had passed since the preceding night. Complete or nearly complete obstruction was diagnosed and exploration was advised. Under spinal anesthesia a loop of ileum was found adherent to the back of the uterus and was twisted 180 degrees. This was freed and untwisted and an ileostomy tube was passed out through a stab wound in the side. A small abscess with local peritonitis was also found back of the uterus. Drains were put into the pelvis. The patient made a very good recovery even though a little stormy.

Diagnosis

First of all comes the history. A general history of the patient with his previous illnesses, operations, accidents, etc., and a detailed history of his present trouble with a careful account of the sequence of events are essential. A thorough examination of the patient with

special attention to hernial openings is then necessary. Rectal and vaginal examinations and possibly also a proctoscopic examination or a barium enema complete the examination. The laboratory findings are of the least assistance but should not be overlooked. X-ray studies come in the same category.

With all the data sifted, one may still have to fall back on that indefinable, but yet very real sense of diagnosis only derived from years of observation and experience with the many perplexing problems of a medical or surgical practice. The diagnosis is a combined problem for the medical and surgical men working harmoniously together. That is why, perhaps, the older men with both a wide medical and surgical experience make fewer mistakes.

Treatment

Acute intestinal obstruction, once fully established, is a fatal disease unless the closure of the bowel is relieved and therefore one can not procrastinate.

As preventive measures, the lesions that might cause obstruction can be dealt with—hernias repaired, operations done in such a manner and so gently that adhesions will not form.

Chronic obstructions can be treated to prevent their becoming complete. Subacute cases may be at least

partially relieved by duodenal suction. Duodenal suction is a wonderful aid in treating postoperative paralytic ileus. I feel, however, that a great deal of harm can be done by its indiscriminate use in acute intestinal obstruction. Put the suction in early if you wish, and keep it up until a diagnosis is established, keeping it up only if very definite improvement is noted. No matter how careful we are, we can never be certain whether or not strangulation is present and the suction will not relieve this condition but only give a false sense of security and valuable time will be lost when operation should be immediate.

When reasonably certain that you are dealing with an acute obstruction, do not wait longer than to get some fluids, Ringer's, glucose or possibly blood, into the patient before resorting to immediate operation. Every hour of delay increases the mortality in almost geometric proportions.

As this is not a complete paper on the treatment, I will not go into the important and varied problems the surgeon must meet, but will merely mention that they often tax the ingenuity and skill of even the most experienced surgeons.

Operation and *early operation* is the treatment for acute intestinal obstruction.

A Clinic on Disease of the Biliary Tract*

Albert M. Snell, M.D.†

Rochester, Minnesota,
and

Donald L. Kegaries, M.D., and Earl W. Minty, M.D.,
Rapid City, South Dakota

THE TWO SYMPTOMS which most frequently call attention to the biliary tract are pain and jaundice. The former may be of the classical type to which long usage has given the name, "biliary colic," and the presence of such a condition is usually the first definite warning given by gallstones of their presence in the bile passages. Jaundice likewise occurring either following an episode of pain, or insidiously without it, points to an obstructive lesion of the biliary tract. Neither pain nor jaundice necessarily depends on stones for its production but the association of these symptoms with stones is so frequently observed that any patient with these complaints becomes by that fact alone a subject for surgical consideration. Pain, even of the classical, colicky type may be dependent on physiologic as well as pathologic disturbances and jaundice may ensue from a variety of lesions in the bile passages or in the liver itself. We propose to discuss certain clinical problems encountered in dealing with these symptoms in the cases to follow.

Report of Cases

Case 1. A white man aged fifty-eight years, was admitted to hospital April 12, 1937, complaining of jaundice of four weeks' duration. His illness probably began four months earlier when slight lumbar pain, general malaise, and nausea were noted; about two months later he lost his appetite and complained of vague, dull distress in the right lower quadrant of the abdomen. Early in March jaundice made its appearance; there was no severe pain at that time and none to speak of thereafter. The jaundice became progressively deeper and the patient lost about 30 pounds (14 kg.). At the time of his admission to hospital, deep jaundice was present, the stools were acholic and the urine was deeply bile-stained. Examination of the blood gave no evidence of disease other than slight anemia. On examination of the abdomen a globular mass, presumably a distended gallbladder, was felt in the right upper quadrant of the abdomen, beneath the costal margin. The blood pressure was 110 mm. of mercury systolic and 64 diastolic; the temperature was 99.4° F. and the coagulation time of the blood was 3.25 minutes.

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† Associate professor of medicine, University of Minnesota Graduate School of Medicine. From the Division of Medicine, the Mayo Clinic, Rochester, Minnesota.

Inasmuch as the jaundice was obviously of the obstructive type and had remained constant over a period of four weeks, exploration of the biliary tract was advised. On May 6, under gas and ether anesthesia, the gallbladder was opened and drained. The organ was found to be distended to about three or four times its normal size and on opening it white bile was obtained. The mucosa of the gallbladder was covered with a mucoid coating and blood escaped when this substance was wiped away. Both hepatic ducts were dilated to the size of a man's little finger; the common duct was dilated to the size of a man's thumb. Stones were not found in the gallbladder or ducts but on palpation the head of the pancreas was found to be enlarged and very firm. The liver itself was enlarged, congested, and bile-stained. Cholecystostomy was performed; a tube was secured in the gallbladder and anchored to the skin of the abdominal wall. Several days following operation, dark green bile began draining from the tube and the jaundice decreased slightly. However, the stools still remained acholic. The icterus index one week after operation was 101. A week later, the patient's appetite improved and the jaundice began to fade. May 21, a choledochogram was made; the medium used was skiodan, of which 29 cc. was injected through the cholecystostomy tube. As can be seen in the roentgenogram (Fig. 1), the gallbladder had contracted somewhat and the cystic duct was visible. The common duct was greatly dilated and the roentgenographic medium was present in the intrahepatic bile ducts, extending into the finer biliary radicles within the liver. Obviously there was an obstruction at the lower end of the common duct. Nitroglycerin (1/100 grain, or 0.006 gm.) failed to cause the sphincter of Oddi to relax; a roentgenogram taken after administration of the nitroglycerin was identical with the first.

Discussion: There is, of course, little doubt about the diagnosis in this case. The patient's age and sex, the history of a gradual decline in health, followed by the appearance of jaundice without pain, the complete obstruction to the bile passages, and the palpable and distended gallbladder, all argue for neoplastic obstruction of the common bile duct. The lesion which most commonly produces such a condition is, of course, carcinoma of the head of the pancreas and the surgical findings appeared to confirm the diagnosis of such a lesion in this case. Confirmatory evidence was offered by the choledochogram, which shows the enormous distention of both the extrahepatic and intrahepatic bile passages and the complete obstruction at the ampulla of Vater. This roentgenogram is almost diagnostic, since there is hardly any other condition which can produce a similar effect. Incidentally, it should be emphasized that the practice of choledochography will give much valuable information in cases of external biliary fistula, or in cases in which the common duct is being drained by T-tube. The extent to which this method has been used to study the anatomy and physiology of the bile passages will be apparent in later paragraphs.

A few words may be said in regard to the prognosis in the case under consideration. There is no other point



Fig. 1. Choledochogram showing complete obstruction at the ampulla, with enormous dilatation of the extrahepatic and intrahepatic ducts.

in the body where so small a tumor can produce such marked effects and call attention to its presence so early in the course of development. Having provided this patient with an outlet for the dammed-up bile, one can reasonably expect him to enjoy good health for a considerable period, depending on the rate of growth of the tumor. It is possible that the lesion in the pancreas itself may be benign and inflammatory; there are records of many cases in which cholecystostomy or cholecystgastrostomy has been performed for a supposed pancreatic carcinoma, the patient thereafter surviving and enjoying good health. It is certain that chronic pancreatitis may produce complete and long-standing biliary obstruction. Unfortunately, it is virtually impossible to be certain of the diagnosis, even at operation, since a specimen for biopsy can be obtained from the pancreas only with considerable risk to the patient and usually biopsy is avoided because of the danger of external pancreatic fistula. The external drainage of bile in such cases is a problem in itself.

How long will this patient tolerate the loss of bile through the external fistula which is now present? In both clinical and experimental work it has been found that there is great variation in tolerance to an external fistula and cases are on record in which such fistulas have persisted for years without great harm to the patient. In most cases, however, there is loss of weight, increasing cachexia, digestive disturbances, and finally a terminal hemorrhagic state. Hawkins and Brinkhaus have shown that this hemorrhagic tendency is owing to a deficiency in prothrombin and that this can be corrected by collecting bile from the fistula and returning it to the digestive tract. This undoubtedly should be done in this case. The presence of bile in the intestine will

favor the absorption of fats, vitamins, minerals, and other essential substances in the diet; it can be given by stomach tube, although many individuals have taught themselves to mix the bile with fruit juice or carbonated beverages and to take it by mouth without difficulty. If feedings of bile and a high carbohydrate diet can be continued for a time it may be possible to re-open the abdomen and perform cholecystogastrostomy, thus providing a permanent method of biliary drainage and leaving the patient in the best possible condition under the circumstances. Even if the pancreatic lesion proves to be malignant, such a procedure will insure a year or more of comfort; if the lesion is benign, the operation may be curative.

The following three cases illustrate various aspects of the problem of biliary pain, both from the point of view of diagnosis and from that of the physiologic mechanisms involved.

Case 2. A woman, aged forty-seven years, presented herself for examination in December, 1935. The past history was unimportant except that a pelvic operation had been performed in 1918 and had been followed by severe vomiting and hematemesis. The patient recovered spontaneously and was well until about ten years later when attacks of severe epigastric pain, coming on without relationship to taking of food, were first noted. These were irregular in time of appearance and did not seem to bear any relationship to the usual symptoms of peptic ulcer. About November, 1935, typical attacks of biliary colic were first noted and were of sufficient severity to require hypodermic injections of morphine for relief. These were followed by vomiting and residual soreness in the right upper quadrant of the abdomen. A cholecystogram, made at that time, disclosed the presence of a poorly functioning gallbladder containing stones. A diagnosis of cholelithiasis was made and exploration was advised. At operation, December 13, 1935, a large, chronically inflamed gallbladder, containing stones, was found; the cystic duct was tortuous but contained no stones. The common bile duct was perfectly normal to palpation and was not dilated. Cholecystectomy was carried out with some difficulty because of dense adhesions but the common duct was not opened. Convalescence was satisfactory and the patient was dismissed from the hospital after the usual interval.

The woman presented herself for examination again in November, 1936, stating that she had had occasional attacks of biliary colic for some months past. These were less severe than they had been before operation but they were followed by rather marked digestive disturbances, with nausea and vomiting. Morphine had been required for relief on several occasions but there had been no jaundice, chills, or fever. Because of the persistence and severity of her symptoms it seemed not unlikely that a residual stone was present in the common duct and with this in mind a second operation was performed on November 9, 1936. The common duct was exposed, opened, and explored with scoops; it was not dilated and stones were not found. A T-tube was placed in the duct for a prolonged drainage. This was removed

in the course of about two months and the patient thereafter had no further difficulties of any consequence. There have been one or two minor digestive upsets, presumably caused by dietary indiscretions.

Discussion. The persistence of biliary colic following cholecystectomy among patients with normal bile passages, free from stones and infection, is a problem which has puzzled students of biliary physiology for many years. The condition is relatively uncommon and only a small percentage of patients complain of symptoms of this type following cholecystectomy. The majority of sufferers from the condition are women and many have suffered from supposedly neurogenic visceromotor disturbances in addition to cholecystic disease. The principal symptom mentioned by these individuals is severe colicky pain which arises in the region of the gallbladder and sometimes extends to the right subscapular region. These attacks usually begin and end suddenly and are accompanied by nausea and vomiting. Chills, fever, leukocytosis, jaundice, and residual soreness are absent. The attacks vary in severity and occur without reference to the taking of food.

Exploration of the extrahepatic bile passages has been carried out in many of these cases at varying lengths of time following cholecystectomy; the surgical findings as a rule have been essentially negative. In spite of the paucity of pathologic findings, drainage by T-tube and decompression of the biliary tract has, in most instances, produced relief. Repeated clinical and laboratory studies in such cases have failed to demonstrate any evidence of other abdominal disease or of any disorders arising in the central nervous system. In some cases injection of lipiodol into the biliary tree by way of the T-tube has shown the presence of tonic contraction of the ampullary portion of the duct. All available information about individuals affected with this syndrome, called for want of a better term "postcholecystectomy colic," points to a purely physiologic disturbance, dependent on some motor dysfunction of the choledochal sphincter and associated with temporary increases of pressure in the hepatic duct system.

The motor functions of the biliary tract require brief consideration as an introduction to the discussion to follow. It is now generally agreed that the gallbladder fills during the digestive cycle, and discharges itself in response to a hormonal stimulant, cholecystokinin, which is produced by the passage of certain food substances through the duodenum. In connection with this cycle of filling and emptying, the sphincteric mechanism at the choledochoduodenal junction comes into play.

The existence of such a sphincter has been disputed by some authors but Boyden, working from the embryologic standpoint, Hendrickson from the anatomic standpoint, and Mann and Higgins, as well as McMaster and Elman, from the physiologic standpoint have advanced proof of its existence. Although anatomically inconspicuous, the sphincter is of great physiologic importance, forming an integral part of the functional unit which regulates cholecystic filling and evacuation. During the fasting state, the sphincter is in contraction and can

resist a much greater pressure than the secretory pressure of the liver. Closure of the sphincter allows the gallbladder to fill and, conversely, relaxation of the sphincter permits the gallbladder to discharge its contents into the duodenum.

Cholecystectomy alters the mechanism of biliary flow to a great extent. Following such a procedure the sphincter becomes temporarily incompetent but subsequently recovers its normal tone. As Judd and Mann have demonstrated, this physiologic property of the sphincter is responsible for the dilatation of the extrahepatic ductal system which invariably follows cholecystectomy; at least, if the sphincter is sectioned, this dilation does not occur. Considerable intraductal pressure may be built up by resistance of the sphincter to the secretory pressure of the liver. If one assumes that the sphincter may become spastic, irritable, or hyperkinetic after cholecystectomy, it is easy to see how intraductal pressure might be elevated to a very significant degree. In other words, there is a sound physiologic explanation for postcholecystectomy colic provided one could prove: (1) that a measurable tonic contraction of the choledochoduodenal sphincter occurs in human subjects, and (2) that increased intraductal pressure causes pain or colic in human subjects.

Proof of both of these points has been advanced recently. It has been shown by Zollinger that distention of the common duct with a small balloon inserted at operation will produce biliary colic, nausea, and vomiting. McGowan, Butsch, and Walters^{2,6} have demonstrated by means of studies of pressure in the common duct and by injection of lipiodol into the biliary tree, that the biliary colic which occurs following cholecystectomy is owing to spastic contraction of the sphincter of Oddi with a sharp rise in intraductal pressure; such rises in pressure paralleling roughly the severity of the patient's distress. In order to study this matter in more detail it was necessary for them to find some means by which contraction of the sphincter could be induced. It was discovered that morphine sulphate and other derivatives of opium had just such an effect on the sphincter of the common duct and it was possible in the individuals which they studied to precipitate painful contractions of the sphincter, and rises in intraductal pressure, by this means. Search for a drug which had the opposite effect proved to be arduous and difficult, but finally it was found that nitroglycerine and amyl nitrite were capable of causing prompt relaxation of the sphincter, a fall in pressure, and complete relief from distress. This observation has been verified in a great many instances and the therapeutic results obtained in these cases has justified continued use of nitrites for relief of pain of this type. Sensitivity to derivatives of morphine is a definite characteristic of some of these individuals, as is illustrated by case 3.

Case 3. A white man aged sixty-three years, first consulted a physician because of indigestion and a dull pain in the right upper quadrant of the abdomen, beneath the costal margin. The attacks of pain and indigestion were more or less continuous but never very severe. At times

the man could not eat without distress; at other times he could eat any type of food. Four months before operation, in 1919, he had been jaundiced for a short time; at various times he had had periods of vomiting of two to three days' duration. A strawberry gallbladder was removed in 1919. The patient was well from that time to 1930, at which time a spinal anesthetic was given before prostatectomy. Thereafter the man complained of continuous, dull pain in the right upper quadrant of the abdomen, which lasted for more than a year. This had not been associated with nausea or vomiting. Since 1930, the patient had had three acute attacks of colicky pain in the right upper quadrant, beneath the costal margin. With the first two attacks the pain lasted thirty minutes. In 1936 an attack of left renal colic occurred and the patient took $\frac{1}{4}$ grain (.016 gm.) of morphine by mouth, thus precipitating an acute attack of pain in the right upper quadrant. In April, 1937, he had another very severe attack of biliary colic and a physician was called who administered amyl nitrite; this relieved the patient's distress in thirty seconds.

Discussion. Are we justified in assuming that a patient who has postcholecystectomy biliary colic, who is sensitive to morphine, and who is relieved by nitrites, is suffering only from a physiologic disturbance? Considerable further study will be required to answer this question, but it seems reasonably clear that not all patients who have a hypertonic and irritable sphincter are sensitive to morphine; neither are they all relieved of biliary colic by administration of nitrites. Also, it must be admitted that a considerable number of persons with stone-filled gallbladders are promptly relieved of their attacks of colic by inhalation of amyl nitrite. In other words, neither sensitivity to morphine nor relief from nitrites is necessarily diagnostic. Undoubtedly many patients have residual stones in the common duct and complain of conditions which are indistinguishable from the physiologic disturbance mentioned above; in these cases the diagnostic problem is indeed a difficult one, as is shown in case 4.

Case 4. A white woman, aged thirty-one years, sought medical attention because of severe pain in the right upper quadrant of the abdomen and indigestion, persisting over a period of nine years. Qualitative distress from eating fatty and fried foods, radishes, onions, and cabbage had been noted. The woman was deeply jaundiced following one attack eight years before. For a month or two before examination the pain had become almost continuous and was aggravated by eating. Examination gave essentially negative results except for marked tenderness in the right upper quadrant of the abdomen, just below the ribs. February 19, 1935, at cholecystectomy, the gallbladder was found to be filled with stones and nine stones were taken also from the dilated common bile duct. A T-tube was inserted for prolonged drainage of the biliary tract. The postoperative course was uneventful and the patient was dismissed from the hospital with the T-tube still in place. She was instructed to keep this clamped but to release it if she experienced any pain. On April 13, 1935, approximately two months

Summary

From the evidence presented, it appears that biliary colic depends, in some instances at least, on a spastic contraction of the sphincter of Oddi and a subsequent rise in intraductal pressure. This is certainly true of patients who have the so-called postcholecystectomy colic, whose gallbladders have been removed and whose bile passages are free from stones and infection; it may also apply to some individuals whose biliary tract has not been invaded surgically and whose gallbladders present varying degrees of pathologic change. Since nitrites have a specific relaxing effect on the sphincter of the choledochus it is logical to use them in an attempt to relieve biliary colic from whatever cause, although there is no assurance that pain will be relieved in every case. The contraction of the sphincter produced by morphine and its derivatives has been described and a case cited wherein biliary colic was provoked by its use. This does not mean that use of morphine is contraindicated in cases of biliary colic, since its analgesic effect in such circumstances has been observed by generations of physicians. It does indicate, however, that small doses, which contract the sphincter and do little else, are likely to increase the pain, and it also points to the necessity of studying the reaction of the individual patient to morphine and nitrites. Finally, it is important to recall that neither sensitivity to morphine nor relief from nitrites is necessarily diagnostic of any particular set of conditions existing within the gallbladder and bile ducts. The symptoms produced by stone of the common duct and by physiologic hyperactivity of the sphincter are, in many instances, identical and often one cannot be absolutely certain of the state of affairs within the bile passages unless careful exploration has been carried out.

The existence of these physiologic disturbances must be considered in diagnosis of biliary pain; it is probable that further studies on the physiologic and pharmacologic aspects of the problem will provide both a better understanding of the problem and more satisfactory methods of treatment.

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Fig. 2. Choleldochogram showing moderate dilatation of the duct system with spasm at the ampulla.

following the operation, the patient returned to hospital and a choleldochogram was made (Fig. 2). Skiodan was injected into the common duct by way of the T-tube, and since there was a free flow of this medium into the duodenum and since there were no shadows suggestive of residual stones, the tube was removed. The choleldochogram showed some spasm and contraction of the papillary portion of the common duct; this could be explained on the basis of hypertonicity and irritability of the sphincter of Oddi. About twenty-four hours after removal of the tube the patient had severe colic in the right upper quadrant and epigastrium. A hypodermic injection of morphine gave relief. Since then the patient has gained weight and has been feeling well with the exception of several attacks of pain in the same situation. There have been two attacks of acute pain within the past two weeks, each of which has lasted approximately an hour. There has been no nausea or jaundice following these attacks and there has been no extension of the pain posteriorly.

Discussion. Had this patient consulted a physician when she had this pain, a trial of amyl nitrite or nitroglycerin might have given useful information, since it is our opinion that these attacks are owing to spasm of the sphincter of Oddi rather than to stones in the common duct. The only thing which will settle this point is continued observation. If jaundice appears it must be explained on the basis of stone, since so far as we know, no patient with sphincteric spasm alone has become icteric. If, on the other hand, symptoms are amenable to administration of nitrites, the only procedure to be recommended is continued observation pending the development of some more definite symptoms of calculous obstruction.

Ectopic Pregnancy

E. C. Hanson, M.D.

Park Rapids, Minnesota

IN HIS TEXTBOOK of obstetrics, De Lee remarks that the incidence of ectopic pregnancy is about one in every 600 pregnancies. Schumann found a rate of one in 303 pregnancies. A member of the staff of the Sivertson Clinic estimated an incidence of about one in every 175 conceptions. During the past 15 years my personal experience has encompassed 1,050 full term confinements, and probably 250 abortions and miscarriages. In the course of the same years, I have operated upon 21 cases of tubal pregnancy. This high incidence, one in 70, provides my greatest incentive for this paper.

Historical Notes

Extra-uterine pregnancy was first reported by Albucasis in the Eleventh Century. From that time until the latter part of the Nineteenth Century, only 500 cases were reported in the literature. In 1878, Veit first suggested the surgical treatment of ectopic pregnancy, but it was not until 1883 that Tait performed the first operation for extra-uterine pregnancy. Since this original operative treatment, rapid strides have been made in its surgical therapy, and probably few other pathological processes have responded with as much attending success. Before the work of Veit and Tait, the condition was considered very rare; so rare, indeed, that one writer stated that this affection was so uncommon that even the directors of a large maternity hospital might not see a case in a lifetime.

Etiology

Of the many possible causes in the literature, prior infections of the Fallopian tubes head the list. Peritoneal adhesions, by constriction of the tube, are an often mentioned factor. Stricture of the tube from old inflammatory processes, or extra-tubal pressure as from pelvic tumors, are cited as causative factors. And finally, anomalies of the tube, kinking of the tube, loss of cilia of the tubal lining cells, and many other etiological factors might be mentioned, even though those mentioned form the vast majority of causes.

Symptomatology

Almost invariably, the last menstrual period of these patients has been at least a week or ten days past due before anything unusual develops. However, nausea, vomiting, morning sickness, and the other feelings and manifestations of pregnancy are described by the patient. Then a slight amount of irregular vaginal bleeding occurs. Such blood is usually dark in color, and pain is present in either side of the lower abdomen. In the average case, the pain disappears after the unadvised use of aspirin or hot applications, only to recur several days later. During this time, even though up and about, the patient is conscious of discomfort in one side of the

lower abdomen. Frequently, walking aggravates the pain. Sexual intercourse is nearly always attended with pain. Previous sterility is often elicited in the history.

This history as outlined may show great variation depending upon the age or size of the fertilized ovum and the amount or suddenness of the bleeding. A small amount of bleeding caused by a partial separation of the decidua from the wall of the tube may cause few symptoms, except a slight distress and tenderness in the lower abdomen. On the other hand, sudden severe hemorrhage may cause excruciating pain by rapid stretching of the tube from hemorrhage. Sudden and extensive hemorrhage may result in all the symptoms of severe collapse or shock. However, the more common type of case is the one having repeated attacks of pain, and the less obvious cases repeatedly consult a physician until the correct diagnosis can be definitely established.

Physical Findings

Repeated bimanual examination by which pelvic changes can be observed is often necessary, for little is to be found by abdominal examination in most cases. At times, mild rigidity and tenderness over the lower abdomen constitute the only findings. In those patients having extensive internal hemorrhage, it is customary to find rigidity throughout the abdomen accompanied by marked, generalized tenderness. When bleeding has been slight, there are varying degrees of tenderness on the affected side. Not infrequently, the patient states that there is less pain after the completion of a pelvic examination than before it was begun. In these instances, the relief of pain is the result of expulsion of blood from a tube over-distended by hemorrhage.

Swelling may or may not be palpable. In thin individuals it may be felt readily, whereas in obese patients the tube or tumefaction must be fairly hard before it is palpable. It is doubtful if one ever feels a pregnant tube until there has been some bleeding into it from a separation of the decidua from the tubal wall. In cases in which there has been much bleeding into the abdominal cavity, one frequently notes a fullness in the cul-de-sac. Sivertson has mentioned pain on pressure upon the rectum in these cases, and in some instances it has been my experience that pain may be elicited by pressure on the sigmoid. As a rule, the uterus is freely movable, even though retroverted or retroflexed. The uterus is always enlarged and may be tilted to one side. The cervix is softer than usual, and one of the most dependable signs is pain on movement of the cervix.

These findings are characteristic of those cases seen between the fourth and tenth week of pregnancy. When the pregnancy has continued four or five months, the pelvic findings are far different. In such cases, the tumor

mass is much larger, even approaching the size of a cocoanut. If the fetus has survived, the tumor (including hematocele) may be even larger. The uterus is fixed, as is also the cervix, and the usual elasticity of the vaginal tract is lost. If hemorrhage into the broad ligament has occurred, a round, smooth mass which renders uterine palpation difficult, is found. The mass is very tender and fullness of the cul-de-sac is not apparent. If massive hemorrhage occurs, dullness of the percussion note in the flanks can be elicited, except in obese patients. In the presence of massive hemorrhage, one also notes a rapid and thready pulse, thirst, pallor, air-hunger, cold, clammy perspiration, and other evidences of shock. Low blood pressure, low hemoglobin, and an elevated leucocyte count, characterize these cases.

Treatment

The mortality rate has decreased as asepsis and surgical technic have improved. Untreated, the mortality rate is extremely high. Schauta, in a series of 121 cases that were treated expectantly, found a mortality rate of 86.9 per cent, whereas in a series of 123 cases treated surgically, the mortality rate was 5.7 per cent.

There is no expectant treatment for this condition. Once the diagnosis has been determined, prompt removal of the parts involved is necessary. Adair advocates waiting in cases with severe hemorrhage and collapse. Many gynecologists do not agree with such a policy, feeling that such cases represent as grave an emergency as any other internal hemorrhage. Thus, the operation should be performed in the most rapid manner consistent with the patient's safety, which comprehends the use of supportive measures or transfusion, if indicated.

In the early stage of pathogenesis of the condition, the operation itself is simple. The abdomen should be opened in the mid-line, with an incision large enough to permit rapid work. Large clots should be removed quickly, but otherwise only sufficient other blood evacuated to permit the operative field to be easily visualized. The Fallopian tube and its contents are then removed, as in any other salpingectomy. It is wise to remove the interstitial portion of the tube by excising a V-shaped piece from the cornu of the uterus. This should then be closed, and covered with two or three layers of peritoneum. In this manner, recurrence in the stump of the tube is avoided. The abdomen is then closed without drainage.

In the accompanying tabulation is found a résumé of 21 cases observed during 15 years of practice. Cases Three and Four, marked with an asterisk, represent two consecutive extra-uterine pregnancies in the same patient. Case Six also represents the second ectopic pregnancy experienced by this patient. In four cases, as can be seen, the records of previous pregnancies are incomplete. In eleven cases it was not possible to obtain adequate history of previous venereal infection. Five cases had complications, although the pelvic inflammatory disease of one case preceded the operation and prolonged the patient's convalescence.

No.	Age	Para	Grav.	Ven. History	Normal Conv.	Complication
1	25	4	5	—	+	—
2	20	1	2	—	+	—
3*	30	4	5	—	—	Phlebitis
4*	32	5	6	—	+	—
5	31	—	—	+	+	—
6*	26	—	—	0	—	—
7	32	0	1	0	+	—
8	28	4	5	0	+	Pelvic Infl. Dis.
9	18	0	1	0	+	—
10	21	1	2	0	+	—
11	30	3	4	+	—	Salpingitis
12	33	1	2	0	+	—
13	22	1	2	+	+	—
14	32	0	1	+	+	—
15	26	4	5	0	—	Pelvic Infl. Dis.
16	27	2	3	0	+	—
17	40	5	6	—	+	—
18	20	0	1	0	+	—
19	25	—	—	0	+	—
20	24	—	1	+	—	Secondary Anemia
21	24	0	1	0	+	—

In addition to the 21 cases listed in the preceding tabulation, four patients were operated upon for extra-uterine pregnancy, and this condition was not found in them. One had a normal miscarriage, but continued uterine bleeding after dilatation and curettage led to a laparotomy, during which an ovarian cyst was discovered and resected. A second case was found to have a normal pregnancy complicated by an acutely-inflamed appendix. The third case demonstrated a chronic salpingitis and an incomplete abortion at operation. In the fourth case, an ovarian cyst proved to be the cause of irregular uterine hemorrhage suggestive of an ectopic pregnancy.

Still another case not included in the above tabulation seems worthy of mention. The patient was an Indian who first consulted my associate in practice, the late Dr. C. A. Houston. Her only complaints were inability to defecate and excruciating pain in the attempt to defecate. No history which would indicate the exact nature of her ailment could be obtained. During rectal examination of the patient a sharp object was found to obstruct the anal orifice. Upon removal, this object proved to be the left frontal bone of a full-term fetus. In view of the fact that this patient was beyond 65 years of age, it must be assumed that this particular pregnancy occurred at least 20 or more years prior to the time that the portion of the fetal skull was removed from the rectum. In his discussion of extra-uterine pregnancy, De Lee cites a case of lithopedion carried for 29 years, reported by Wagner, and one carried for 28 years, reported by Virchow. Also Smith described a case of a calcified fetus which was removed from a woman 94 years old, 60 years after conception. While the case reported in this paper is of shorter duration than the three just mentioned, its duration is long enough to justify its report.

Conclusion

Ectopic pregnancies are not rare, as the presently reported ratio of one in 70 pregnancies will attest. They may, and often will, be overlooked unless one keeps the condition constantly in mind in the presence of menstrual irregularities. The earlier a diagnosis can be made and treatment instituted, the lower the mortality rate will be.

An extra-uterine or tubal lithopedion of a duration equal to or exceeding 20 years is reported.

Tuberculin Tests in State 4-H Club Health Contestants

M. W. Husband, M.D.† and David T. Loy, M.D.†

Manhattan, Kansas

AT THE annual State 4-H Roundups in 1936 and 1937 the health contestants were examined by the Student Health Service, Kansas State College. These health contestants were farm boys and girls of high school age selected through physical examinations in their respective counties to compete in the state health contest. Each county is limited to one male and one female health entry.

As a part of the comprehensive physical examination tuberculin tests were made on each contestant. Before 1936 tuberculin tests were not included as a part of the state health contest. Through the coöperation of Mr. M. H. Coe, state 4-H Club leader, Kansas became the first state, as far as we can ascertain, to introduce routine tuberculin testing of 4-H state health contestants followed by chest X-rays of all positive reactors.

In 1936 the tuberculin tests were made by the intradermal injection of 0.1 milligram of old tuberculin. In 1937 the tests were made by the intradermal injection of 0.0005 milligram of purified protein derivative. This amount of purified protein derivative corresponds to the amount of old tuberculin used in the previous examination and has been recommended by Hall¹ and referred to by him as the intermediate dilution of purified protein derivative.

Each year the results of the tests were read 48 hours after the injections were made. The results were classified according to the following method: *Negative*—absence of redness or swelling at the site of injection. *1 plus*—the appearance of an area of swelling between 0.5 and 1.0 centimeter in its greatest diameter. *2 plus*—the appearance of an area of swelling with its greatest diameter between 1.0 and 2.0 centimeters. *3 plus*—the appearance of an area of swelling with its greatest diameter more than 2.0 centimeters. *4 plus*—the appearance of an area of swelling with definite necrosis. This classification is modified from the one given by the National Tuberculosis Association².

The results of these tests are given in tabulated form in Tables 1 and 2. In 1936 there were 141 contestants with 13 or 9.2% positive reactors. In 1937 there were 117 contestants with 21 or 17.9% positive reactors. Probably the higher percentage of positive reactors found in 1937 is due to the use of a better standardized preparation of tuberculin. Each year there was only one undesirable reaction (4 plus) in the group tested.

The homes of the positive reactors of these groups of boys and girls are fairly well distributed throughout the state.

Each year chest X-rays were made of each positive reactor. We are greatly indebted to Dr. Galen M. Tice,

† From the Student Health Service, Kansas State College.

radiologist at the University of Kansas Medical School, for the interpretation of the X-ray plates. Of the 13 cases X-rayed in 1936 there were 10 that showed no roentgenological evidence of tuberculous lung infection, 2 that showed arrested childhood type of tuberculous lung infection and 1 that showed old pathological lung changes of non-specific etiology. Of the 21 cases X-rayed in 1937 there were 9 that showed no roentgenological evidence of tuberculous lung infection, 10 that showed arrested childhood type of tuberculous lung infection, and one that showed old pathological lung changes of non-specific etiology. There were no active cases of the childhood type of tuberculosis. No cases of the adult type of tuberculous infection were encountered; but it should be emphasized that during the next decade the individuals in this group of tuberculous infections are much more likely to develop tuberculosis than would the individuals of a similar non-infected group, as pointed out by Myers and Harrington³. For this reason we made a uniform deduction in the health score of each positive reactor. In carrying out this procedure we were aware, of course, that this view is not uniformly held by workers in this field⁴.

Each year the X-ray reports of each contestant were sent to their parents by the 4-H state office. This action is in accordance with the main purpose of these special examinations, namely, the dissemination of public health education in modern methods of diagnosis and control of tuberculosis to an intelligent and influential section of the rural population. It is hoped that this tuberculosis program will be adopted by other state 4-H Clubs.

Summary

1. Tuberculin testing with chest X-rays of all positive reactors has been introduced to an important group of the Kansas farm population.

2. Superior general health and absence of physical defects apparently do not appreciably diminish the incidence of tuberculous infection.

3. The one-test method with the intermediate dilution of purified protein derivative apparently detects cases of tuberculous infection with a high degree of accuracy.

4. In 1936 and 1937, deductions have been made in the health scores of 4-H Club state health contestants who had positive tuberculin reactions. It may be found feasible to extend generally this policy of deduction for positive tuberculin reactors to health and insurance examinations.

TABLE I.
4-H Club Health Contestants Tuberculin Tests

Year	Number Tested	Material Used For Testing	Number Positive Reactors	CHEST X-RAYS OF POSITIVE REACTORS				
				Negative	Healed Childhood Type	Active Childhood Type	Adult Type	Old Pathological Changes, of Non-specific Etiology
1936	141	0.1 mgm. O.T.	13	10	2	0	0	1
1937	117	0.0005 mgm. P.P.D.	21	9	10	0	0	1

TABLE II.
Positive Tuberculo-protein Reactors

Year	Sex	County	Old Tuberculin 0.1 mgm. Doses	Purified Protein Derivative 0.0005 mgm. Doses	CHEST X-RAYS
1936	Male	Barton	1 plus		Normal lung findings.
"	"	Pratt	1 plus		Normal lung findings.
"	"	Sedgwick	1 plus		No tubercular infiltration.
"	"	Kiowa	1 plus		No pathology is seen.
"	"	Mitchell	2 plus		Normal lung findings.
"	"	Miami	3 plus		No pathology is seen.
"	"	Comanche	3 plus		No pathology is seen.
"	"	Leavenworth	4 plus		Gohn complex and hilar calcification.
"	Female	Meade	2 plus		Thickened bilateral apical pleura.
"	"	Franklin	3 plus		No pathology is seen.
"	"	Sherman	3 plus		No tubercular infiltration.
"	"	Sherman	3 plus		No pathology is seen.
"	"	Geary	3 plus		Hilar calcification.
1937	Male	Russell		1 plus	Normal lung findings.
"	"	Chautauqua		1 plus	Normal lung findings.
"	"	Labette		1 plus	Hilar calcification.
"	"	Lane		1 plus	Hilar calcification.
"	"	Stafford		1 plus	Normal lung findings.
"	"	Ford		2 plus	No tubercular infiltration.
"	"	Barber		2 plus	Normal lung findings.
"	"	Sherman		2 plus	Hilar calcification.
"	"	Greenwood		2 plus	Hilar calcification.
"	"	Morris		3 plus	Hilar calcification.
"	"	Leavenworth		4 plus	Hilar calcification.
"	Female	Lyon		1 plus	Normal lung findings.
"	"	Stafford		1 plus	Hilar calcification.
"	"	Clay		1 plus	Normal lung findings.
"	"	Ford		1 plus	Hilar calcification.
"	"	Cloud		1 plus	Normal lung findings.
"	"	Dickinson		2 plus	Pleural adhesions to diaphragm.
"	"	Jefferson		2 plus	Hilar calcification.
"	"	Barber		2 plus	Movement (unsatisfactory plate).
"	"	Bourbon		2 plus	Hilar calcification.
"	"	Cloud		2 plus	Normal lung findings.

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The Present Day Status of the Vitamins*
A Review

Marguerite Booth, M.D., and Arild E. Hansen, M.D.†
Minneapolis, Minnesota

Introduction

ALTHOUGH clinical conditions due to avitaminosis were apparently known as long ago as 2600 B. C., and in spite of the fact that deficiency diseases have been of tremendous economic importance throughout the ages, the tardiness in gaining an understanding of these conditions is remarkable. With a gradual acceleration of knowledge beginning less than a

* From the Department of Pediatrics of the University of Minnesota Hospital, University of Minnesota, Minneapolis, Minnesota.
† Assistant professor of pediatrics, University of Minnesota.

half century ago, the whole subject with its vast ramifications has been built up by means of chemical, biological and clinical studies, until at last it has practically attained the status of an exact science. This has been brought about by individual and organized efforts of a multitude of investigators in all parts of the world. Thus, the fact that we today can actually see the vitamins themselves and know or very nearly know the chemical structure of many of those which are important in nutrition, is not the result of pure coincidence or

accident. This is strikingly apparent when one considers that a semi-thorough review during the past several years calls for the consideration of some 200 articles on a single vitamin, or a rough total of about 2000 for any given year.

Not only is the chemical structure of many vitamins known exactly, but recent investigators in various chemical laboratories have also developed chemical tests for determining quantitatively, or approximately so, the amounts of various vitamins in the different tissues. Further developments along these lines may prove to be of far-reaching importance. Many of the ramifications of vitamin experimentation have proved to be surprising. One of the most interesting disclosures is that vitamins have been found to be definitely linked up with the hormones. By the mere removal of a simple methyl group or by the change in a double bond, the vitamin may become hormonal or may take on carcinogenic activity.

One of the popular conditions associated with avitaminosis is the knowledge of the average American is night blindness, because of the fact that this disability corresponds with the alleged time incidence of the greatest number of automobile accidents. The relationship of the vitamins to infections is over-emphasized no doubt in a popular way. Nevertheless, there are certain pertinent facts which clearly indicate that such relationships actually do exist. Not only are we interested in the conditions caused by a lack of vitamins but also by the possible importance of the administration of too much of these substances. As regards the human subject there needs to be little fear of hypervitaminosis.

Judging from a survey of the University of Minnesota Hospitals admissions other than rickets there are relatively few frank cases of avitaminosis in this section of the country. During the nine-year period from 1928 to 1937, covering some 63,500 hospital admissions, there has been but one case of keratomalacia. This infant of 14 weeks had had no cod liver oil but was given a whole milk formula. Although she improved on cod liver oil therapy, the corneal opacities persisted.

Evidences of vitamin B deficiency are difficult to evaluate. Polyneuritis is a major manifestation of vitamin B₁ deficiency, both in experimental animals and in human beings. A careful search of the records during this same period reveals thirty cases of polyneuritis. In none of these did a specific dietary lack appear to be the prime cause of the condition. In this series, there were only six which were of unknown etiology, and even here it was not possible to attribute the complaints to a nutritional deficiency. Recent investigations disclose that many of the clinical types of polyneuritis are related to a quantitative deficiency of vitamin B complex. It is possible that vitamin B₁ deficiency may be partially responsible for the various types of peripheral neuritis found associated with chronic alcoholism, diabetes, pregnancy, and certain toxic states. During this interval, there have been four cases of polyneuritis in chronic al-

coholism, five in diabetes, three in pregnancy, and five were believed to be toxic in origin. Of the conditions which were probably not due to a partial vitamin deficiency, two were due to lead, three to arsenic, while two were post-diphtheritic.

There were but two instances of definite vitamin B₂ deficiency. These were cases of pellagra; one in a male of 54 years and the other in a female of 30 years. Acrodynia is thought by some to have a fundamental relationship to vitamin B complex deficiency. In this study, five individuals with acrodynia were found. The age incidence of one of these was unusual: a female of 14 years with symptoms strikingly characteristic of this condition. Of the five cases, three were placed on a dietary regimen high in vitamin B complex. In each instance improvement was noted, but this was gradual. The other two cases were unable to be followed.

There have been two patients showing slight X-ray evidence of scurvy but without the typical findings. These were seen before cevitamic acid determinations were used. Rickets in a mild degree is very common and the sequelae are apparent for years afterwards. Only twenty-seven cases were admitted to the hospitals, in which rickets formed the major part of the acute clinical picture. There were six of these which had the symptoms and findings of latent or manifest tetany.

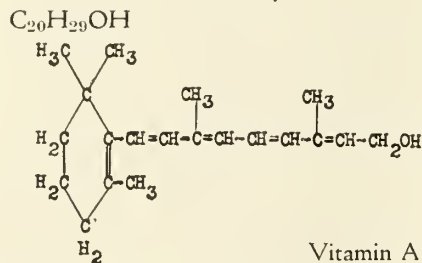
Of even greater importance than the presence of these infrequent cases of florid avitaminosis is the occurrence of subclinical states of vitamin deficiency. This is particularly significant because of the interrelationships between vitamins and certain clinical disorders. For example, Weiss and Wilkins, as well as Sure and Jones, have demonstrated that the administration of vitamin B extracts produces favorable clinical response in cardiac dysfunction. The development of chemical means for the detection of vitamin deficiencies has already aided materially in our understanding of certain of these maladies, and no doubt we can anticipate rapid progress in this phase of the subject in the near future. The fact that our knowledge concerning the nature of these deficiency diseases has advanced so definitely necessitates a more specific nomenclature regarding these conditions. At the recent meetings of the American Society of Biological Chemists, a committee was formed to revise the vitamin terminology. The use of the letters of the alphabet for designation purposes appears to be meeting with disfavor. Preliminary expressions recommended are thiamin for vitamin B₁; riboflavin for vitamin B₂; ascorbic acid, an expression used by organic chemists, for vitamin C; and calciferol for at least one of the types of vitamin D. Until more definite steps are taken to establish the newer terminology, the alphabetical names which we have followed in this review will be used for some time.

VITAMIN A—History

In 1913, McCollum and Davis, and Osborne and Mendel simultaneously described experiments which showed that certain fats were essential for normal growth. Three years later, McCollum suggested the

term "fat-soluble A" to distinguish it from the "water-soluble B." Steenbock, in 1919, noted some correlation between the vitamin A effect of certain vegetables and the amount of the yellow pigment carotene present in these foods. Euler demonstrated that carotene could replace vitamin A in the diet (1928). In 1930, Moore showed that carotene is converted into vitamin A in the liver and is stored there as the vitamin. Karrer (1931) and Drummond (1932) isolated the almost pure unsaturated alcohol from fish livers. In 1935, Lasch showed that liver storage of vitamin A is for the most part in the Kupffer cells.

Chemistry



An unsaturated alcohol with four double bonds in the side chain and one in the ring.

Precursors of vitamin A:

1. Alpha carotene
2. Beta carotene
3. Gamma carotene
4. Cryptoxanthin

These precursors of the vitamin are vegetable pigments which are converted by the liver into the compound vitamin A itself. Carotene occurs in nature usually as a mixture of two or more isomeric forms. The chemical composition of these isomers differs slightly, but all have at least one beta-ionone ring, a grouping which seems necessary for vitamin activity. Vitamin A has the structure of one-half the carotene molecule with an alcohol group at the end of the chain. Since beta carotene is symmetrical and contains two beta-ionone rings, two molecules of vitamin A could be formed from it by breaking it down at the middle double bond with the formation of a primary alcohol at the terminal carbon atom. Alpha and gamma carotene are not symmetrical and contain only one beta-ionone ring, hence forming only one molecule of vitamin A when broken down. The vitamin activity of beta carotene in small concentrations is double that of alpha carotene. Experimental evidence supports this theory.

Carotene is intensely yellow, while vitamin A is colorless. The vitamin is very soluble in fat and occurs as an ester in fish liver-oils. It gives a characteristic though not entirely specific blue color with antimony trichloride in the presence of chloroform. It has a highly characteristic strong absorption band at 328 mμ in ultra-violet light. Very little vitamin A is lost during processes of commercial canning or home-cooking. Vitamin A has been isolated in nearly pure form, but has not been synthesized.

Standardization

The U. S. P. XI unit for vitamin A (equivalent to the International unit) is the amount in milligrams producing the growth-promoting and anti-xerophthalmic activities in vitamin A-depleted rats equal to that of 0.6 gamma of the International standard beta carotene, or the equivalent amount of U. S. P. Standard Reference cod-liver oil.

The standard of pure beta carotene adopted by the International Conference is dissolved in coconut oil to which hydroquinone has been added. The subsidiary international standard for vitamin A is the U. S. P. Reference cod-liver oil which has a potency of 3000 units per gram.

The U. S. P. XI requires that 1 gram (15 grains) of cod liver oil shall contain at least 600 U. S. P. units of vitamin A.

Pathology

The primary effect of vitamin A deficiency is on epithelial structures—a keratinizing metaplasia of the greater part of the ectodermal covering of the body. There is a substitution of stratified keratinizing epithelium for normal epithelium in various parts of the respiratory, alimentary and genito-urinary tract, in the eyes and in the para-ocular glands. This replacement epithelium is identical in all locations and comparable in all its layers with epidermis and is continuously casting off keratinized cells. The accumulation of these epithelial cells in many glands and their ducts and in other organs is a striking gross pathologic feature of avitaminosis A. Cysts may be formed in the glandular organs. In the lungs, these cysts were at first thought to be abscesses, but there is rarely invasion of the tissues. The pulmonary keratinization leads also to bronchial occlusion, bronchiectasis and atelectasis. This metaplasia in human infants and in a variety of laboratory animals has been found in the conjunctiva, mucosa of the nares, accessory sinuses, trachea, bronchi, pancreas, renal pelvis, ureters, salivary glands, uterus, and peri-urethral glands. It occurs earliest in the trachea and bronchi, then in the kidney pelvis, and as late involvement in the eye. Metaplasia of the epithelium of the cornea and of the conjunctival sac is followed by vascularization, edema, and leukocytic infiltration of the cornea. Infection of the cornea may lead to ulceration and hypopyon.

Secondary effects of vitamin A deficiency are decrease in weight due to loss of fat in all storage depots, muscular atrophy, anemia, cessation of growth of bones, degenerative lesions of skeletal muscle, and lymphoid hypoplasia of the spleen. Degeneration of the myelin sheath is a late secondary result.

Restoration of the diet rapidly dispels the lesions of avitaminosis A, unless complicated by destruction of tissue. The change back to the normal epithelium is an abrupt one and affords further evidence that the primary consequence of lack of vitamin A is epithelial, and not of nervous origin.

Chief Symptoms of Avitaminosis A

A. In Man.

1. Night blindness (nyctalopia or hemeralopia), and

xerophthalmia (keratomalacia) eventually leading to partial or complete blindness. Bitot's spots, opaque whitish deposits in the scleral conjunctiva, are the most characteristic signs.

2. Keratinization of epithelial cells in various parts of the body frequently associated with respiratory, gastrointestinal and genito-urinary disturbances.

3. Cornification and eruption of the skin with papular and pustular lesions.

4. Retarded growth, weakness, and loss of weight.

5. Increased susceptibility to infections of mucous membranes (claimed by some, denied by others). Only true where supply of vitamin A has been inadequate or its storage in the body depleted.

B. In Animals (rat).

1. Cessation of growth and loss of weight.

2. Xerophthalmia; impaired regeneration of visual purple.

3. Keratinization of epithelium in respiratory, gastrointestinal and genito-urinary tracts.

4. Formation of urinary calculi.

5. Cutaneous lesions; glandular abscesses.

6. Defective formation of teeth and gums.

7. Impaired reproduction: prolonged gestation, fetal death and dystocia.

8. Loss of vigor.

Laboratory Diagnosis

Test for subnormal dark adaptation—based on the ability of the patient to regenerate rhodopsin (visual purple) after exposure to a calibrated source of light—elaborated by Jeans and Zentmire (1934). This is particularly valuable in mild deficiency.

Clinical Applications of Vitamin A

1. Promotion of normal growth in children.

2. Prevention and cure of night blindness and xerophthalmia due to lack of vitamin A.

3. Prevention of renal calculi claimed by Higgins—but discredited by the A. M. A., Council of Pharmacology and Chemistry.

4. Maintenance of normal epithelium of the body.

5. Normal tooth formation.

6. Cure of senile vaginitis—by large doses of cod liver oil or haliver oil (Simpson and Mason).

7. Treatment of epithelial lesions and healing of wounds by the local application of vitamin A in an ointment medium. (Proto and Sandor)

Vitamin A can be given in many foods containing the factors in the form of the vitamin or as its precursor, carotene. Carotene is not as well absorbed as vitamin A, hence the vitamin is the more satisfactory preparation to use by mouth. The absorption of vitamin A or of carotene may be impaired by infections, pregnancy, absence of bile, and other pathological processes, such as damage to the liver which interferes with its ability to convert carotene to vitamin A. Crystalline carotene is better than vitamin A for parenteral use. At present, there are no pure or injectable preparations of vitamin A available.

Daily Requirements

The quantitative requirement is as yet unknown.

Children require more per kilogram of body weight because of the demands of growth.

1934 Salter	as minimum	0.3 mg. carotene
1935 Harris	as minimum for adults	1,000 U.S.P. I.U.*
1936 A. M. A.	for children	6,250—10,000 I.U.

* League of Nations for pregnancy and lactation 9,000 U.S.P. units

Larger doses may be required in severe avitaminosis.

*International units.

Natural Sources—in order of potency

Vitamin A:

Halibut liver oil is the richest source.

Burbot liver oil ranks next (4 to 10 times as potent as cod liver oil).

Cod liver oil.

Liver.

Whole milk supplies more than any other single food.

Large amounts: butter, egg yolk, animal fats (beef and mutton).

Provitamins:

Apricots are the richest plant source.

Large amounts—spinach, carrots, chard.

Smaller amounts (1/6 as much as butter)—green beans, green peas, Brussels sprouts, lettuce, tomato, yellow squash, sweet potato, pumpkin.

VITAMIN B COMPLEX

History

In 1884, Takaki of the Japanese Navy demonstrated that kakke (beriberi) was of dietary origin. Eijkman believed that it was due to a poison in polished rice (1887). Funk in 1912 proposed the name "vitamin" for the substance derived from rice polishings which cured beri-beri. Mendel suggested that another factor than certain fats was necessary for normal growth (1914). McCollum found this substance was water soluble and in 1916 proposed the terms "fat-soluble A" and "water-soluble B." The multiple nature of vitamin B was proved by Smith and Hendrick, and confirmed by Goldberger, separating the pellagra-preventing factor from the anti-neuritic factor. Four other elements have been partitioned off, and since 1927 the vitamin has been known as vitamin B complex.

Constituents

Vitamin B₁.....antineuritic factor

Vitamin B₂ (G) complex

1. Vitamin B₂ or lactoflavin growth-producing factor

2. Vitamin B₆.....rat antidermatitis factor

3. P. P. factor (pellagra-preventing in man)

or Vitamin H of György

Vitamin B₃.....chicken antipellagra factor

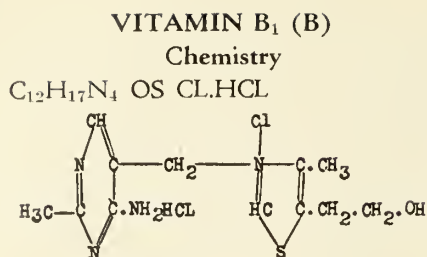
? growth-producing factor

Vitamin B₄.....antiparalysis and anti-en-

cephalomalacia factor.

Perhaps a variation of vitamin B₁

Vitamin B₅.....including chicken anti-pellagra factor



Aneurin of Jansen, or Torulin

The hydrochloride of a pyrimidine-thiazole compound. Windaus first proposed the formula of $C_{12}H_{16}N_4OS$ —when he isolated the crystalline vitamin B₁ in 1931. The vitamin is a base and reacts with acids to form salts. The formula usually given at present is that obtained by the action of hydrochloric acid on the free base. There is still some doubt about the positions of certain groups and double bonds. The sulphur linkage is not that of cystine. Vitamin B₁ has also been isolated in crystalline form from baker's yeast or rice polishings by Jansen and Donath, by Peters, Otake and by Van Veen, some with slightly different formulae. It has been synthesized by Williams and Cline (1936).

Crystalline vitamin B₁—hydrochloride is water-soluble. It is stable to heat in the dry state, but is rapidly destroyed by moist heat at 100°C especially in alkaline medium. Its melting-point is 245°C. Its ultraviolet absorption band is at 250-260 mμ. (Windaus) or 245-249 mμ. (Peters).

Standardization

The Sherman unit is that amount which when fed as a daily allowance to a standard test animal (rat) previously depleted of vitamin B₁ will suffice to cause a gain in weight of three grams per week during an experimental period of four weeks.

The International Unit is the vitamin B₁ activity of 10 milligrams of the International Vitamin B₁ Reference Standard which is an adsorbate prepared from rice polishings by the method of Seidell as described by Jansen and Donath.

Ten to twenty milligrams per day of this Reference Standard are necessary to maintain normal growth in young rats, or 20 to 30 milligrams for a cure of pigeon polyneuritis.

N. N. R. Requirements—1936

Foods claiming vitamin B₁ content as a medicinal source must provide at least 200 International units in the quantity of food consumed daily.

Concentrates of vitamin B₁ or a dehydrated natural product must exceed a potency of 25 International units per gram or per cubic centimeter.

Pathology

Human beriberi and pigeon polyneuritis show the same pathologic changes: enlargement of the heart, particularly the right ventricle, edema, atrophy of muscles, and degeneration of the nervous system. Wolbach believes that it is best to regard all the abnormal findings

thus far recorded as secondary effects, and to consider the primary pathologic changes due to vitamin B₁ deficiency as not demonstrable at present.

The striking lesion is Marchi degeneration of the myelin sheath of peripheral nerves—which appears late in avitaminosis B₁. Further work is necessary to prove that this is due to specific lack of vitamin B₁ or to some other factor, such as starvation. Other secondary features are chronic passive congestion, and enlargement of the islands of Langerhans in the pancreas.

Chief Symptoms of Avitaminosis B₁

A. In Man.

1. Beriberi

(a) Peripheral neuritis with paralysis of extremities and muscular atrophy or edema.

(b) Vasomotor symptoms: heart palpitation, dyspnea, enlargement of right side of heart.

2. Retarded growth and development.

3. Polyneuritis, especially of alcoholic origin; also in pregnancy, in diabetes, and in malnutrition in children, and in the malnutrition associated with chronic diseases or some primary alimentary disease.

4. Gastro-intestinal disturbances: atrophy of lingual papillae, achlorhydria, intestinal hypotonicity.

5. Ocular disorders: retinal hemorrhages, optic neuritis.

6. Anorexia.

7. Impaired carbohydrate metabolism.

8. Failure of lactation.

B. In Animals (rat and pigeon).

1. Retarded growth and loss of weight.

2. Polyneuritis (pigeon).

3. Anorexia.

4. Paralysis and convulsions (rat).

5. Impaired oxidation of lactic acid and pyruvic acid in carbohydrate metabolism, resulting in injury to the central nervous system.

6. Bradycardia.

7. Disturbance of intestinal function; gastric atony.

8. Impaired reproduction:

(a) Atrophy of the testes.

(b) Atrophy of the ovaries.

9. Failure of lactation.

Laboratory Diagnosis

1. Urinary Excretion Test.

The amount of vitamin B₁ excreted in the urine (demonstrated by biological assay of the urine) may be used as an index of the dietary intake.

A daily excretion of less than 12 International units per day (for a 140 lb. man) and failure to show a response to a test dose of 500 International units per day are presumptive evidence that the diet is below normal in vitamin B₁ content. The normal output is from 12 to 35 International units.

2. Arakawa Test.

The maternal milk is tested for vitamin B₁ content. The Arakawa reaction is based on the close relationship between the peroxidase reaction of the milk and the

state of deficiency in vitamin B₁. If a blue color develops when the milk is mixed with three reagent solutions, a positive test for the presence of the vitamin is obtained. If no blue color appears, the Arakawa test is negative—indicating a lack of the vitamin in the milk.

3. Estimation of previous vitamin B₁ intake and of the requirements of the vitamin by Cowgill's formula.

Clinical Applications of Vitamin B₁

1. Prevention and cure of beriberi.
2. Promotion of normal growth in children.
3. Anorexia due to avitaminosis B.
4. In chronic alcoholism with vitamin B-deficiency polyneuritis.
5. In pernicious vomiting and polyneuritis of pregnancy.
6. For nutrition in lactating women.
7. Valuable in concentrated form in conditions where ordinary foods are poorly utilized.
8. In diabetic neuritis.
9. In cardiovascular disease (Weiss and Wilkins—1936. Sure and Jones—1937).

Daily Requirements

The requirement is related to the fuel value of the food consumed and proportional to the metabolism (Cowgill).

1934 Cowgill	.....	About 300 I. U.
1934 Jansen	.....	About 200 I. U.
1935 Vorhaus	as minimum	4000 Sherman units.
	therapeutic dose	10 mg. crystalline vitamin
		250 to 500 I. U.
1936 Harris	.....	About 1 mg. crystalline vitamin
1936		
A. M. A.,	for infants	50 I. U.
Council on	for adults	To 200 I. U.
Pharmacology		
and Chemistry		
1937 Wilder and Wilbur	.....	10-20 mg. crystalline vitamin

Natural Sources—in order of potency

Brewer's yeast and wheat germ are excellent concentrated sources.

Whole grain cereals and bread.

Liver and kidney.

Leafy vegetables have one-fourth the content of vitamin B₁ as in yeast.

Egg yolk.

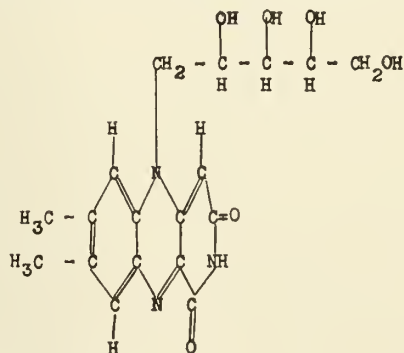
Orange, the highest of the fruits, has one-fifth as much as yeast. The concentration of vitamin B₁ in most raw foods is low and it may further be reduced by heat and loss in solution in the discarded cooking water. Milk, white flour and meat are very poor sources. Vegetables and fruits have but a small amount. Special care should be taken to insure an adequate supply of the vitamin.

VITAMIN B₂ (G) COMPLEX

The antipellagra vitamin is now known to have at least two and probably three factors. It was called vitamin G by Goldberger, but is now generally accepted as identical with pellagra in man. There is now thought to be a separate P. P. factor in the vitamin B₂ complex. György calls this fraction vitamin H.

Chemistry: Vitamin B₂ (G)

The chemical formula was at first thought to be C₁₇H₂₀N₄O₆ (Kuhn), but was later (1935) proved to be C₁₅H₂₁N₃O₆—6.7 dimethyl—9 isoalloxazin.



Vitamin B₂ is the water-soluble and heat-stable naturally occurring yellow pigment, lactoflavin. It is bleached and destroyed by exposure to visible light, especially in the blue-violet portion, and by alkaline media. It is relatively insoluble in alcohol. It is adsorbed by fuller's earth from acid solution and is precipitated by lead acetate. The melting-point of the best natural and synthetic preparations is 282°C. The specific rotation is: 96.6° for a 0.15% solution in 0.05 N NaOH, and 90.0° for a 0.1% solution. In the presence of boric acid, lactoflavin is dextrorotatory. It possesses an ultra-violet absorption band at 260 mμ. and also in the visible range. Flavin dissolves in water giving a bright yellow solution with a characteristic green fluorescence. Strong reducing agents convert it into the colorless form, but it is easily oxidized again by shaking it with air. Lactoflavin has been isolated from milk by Kuhn, Booher, and Karrer, and has been synthesized by Stern and by Kuhn (1934). Ovoflavin and hepaflavin are also growth-producing and are similar chemically. Vitamin B₄ appears to increase the action of lactoflavin in promotion of growth.

György, Kuhn, and Wagner-Jauregg believe lactoflavin is closely related to the "yellow oxidation enzyme" of Warburg. This enzyme seems to consist of flavin in combination with a colloidal carrier, and acts as a carrier catalyst taking up hydrogen from the substrate, later being oxidized to the original enzyme. Since this enzyme is probably necessary for the animal body, and since flavin is not able to be synthesized in the body, it is necessary to include vitamin B₂ in the diet. In the flavin enzyme is the best example hitherto known of the relationship between an enzyme and its active group of vitamin or hormone character.

Standardization

The Sherman unit for vitamin B₂ is that amount which when fed daily to a standard test rat that has been previously depleted of vitamin B₂ according to the prescribed technique, will promote a gain in weight of three grams per week over a period of from four to five weeks.

Pathology

As in avitaminosis B₁, the pathologic effects seen in vitamin B₂ deficiency are probably only secondary. The histology of human pellagra, black tongue in dogs, and rat dermatitis throws little light on the subject. Degenerative lesions in nerve-cells and myelin sheaths are characteristic of the deficiency—but may not be specific. Lesions of the skin and mucous membranes are consistently present. At autopsy, ulcerative lesions are found in the intestines, similar to those in colitis.

Chief Symptoms of Avitaminosis B₂ (G) Complex A. In Man.

1. Pellagra—due probably to avitaminosis P. P. of the vitamin B₂ complex.

Brown, scaly, symmetrical dermatitis in exposed areas, glossitis, soreness of mouth, indigestion, diarrhea, and disturbances of the nervous system—at times leading to dementia.

2. Acrodynia believed by some to be caused by the lack of one or more of the factors in vitamin B complex. Because of its cutaneous manifestations, acrodynia is often mentioned in connection with vitamin B₂ complex.

Irritability, insomnia, appearance of misery, anorexia, acrocyanosis, itching and burning of hands and feet, desquamation of palms and soles, marked perspiration, photophobia, muscular hypotonicity, increased blood pressure, and loss of teeth.

3. Little is known of lactoflavin deficiency in the human subject.

B. In Animals (rat and dog).

1. Retarded growth and loss of weight (deficiency in lactoflavin).

2. Cataract formation.

3. Dermatitis with loss of fur and ulceration of the skin—due to lack of vitamin B₆. (Acrodynia of rats)

4. Keratitis.

5. Black tongue (in dogs)—due *probably* to deficiency in P. P. factor.

Laboratory Diagnosis

No tests are known.

Clinical Applications of Vitamin B₂

1. Prevention and cure of pellagra.

2. Promotion of growth and well-being (due to lactoflavin).

3. Possible prevention of cataract formation.

4. Increase of vitamin B₂ content of milk in lactation.

5. Cure of stomatitis and glossitis of chronic alcoholism and of alcoholic pellagra—by early treatment with

a high caloric diet and 75 grams of yeast or of liver extract daily. (Blankenhorn and Spies)

6. Treatment of acrodynia.

Pellagra is seen particularly in the southern part of the United States, but in the northern sections one should watch for secondary pellagra—due to organic diseases of the digestive tract—as obstructing and malignant diseases, or to other gastro-intestinal disturbances with faulty absorption: alcoholism, colitis, tuberculous enteritis, celiac disease, *etc.*

The supply of protein may also have a significant bearing upon the pellagra problem, and the vitamin B₂ complex may not be the only deficiency factor. This has been demonstrated by Sherman, rats on high protein diet being less severely affected by the lack of vitamin B₂ than animals on diets with lower amounts of the same protein.

The relationship of vitamin B₂ complex to pernicious anemia has been stressed by Castle and others—claiming that macrocytic anemias of several types are dependent upon vitamin B₂ complex deficiency. However, it has been shown that this vitamin is neither the liver anti-pernicious anemia principle nor the "extrinsic" factor concerned in hemopoiesis.

Daily Requirements

Not yet determined.

Natural Sources

Brewer's yeast and wheat germ—as for vitamin B₁.

Liver and kidney are the richest sources of flavin.

Egg white has high content of flavin but no P. P. factor.

Milk and meat (one-fifth as much as yeast).

Leafy vegetables, tomato and banana (one-tenth as much as yeast).

Fish muscle rich in P. P. factor, but lacking in flavin.

VITAMIN B₃

Williams and Waterman claim that there is a pigeon vitamin B₃ necessary for supplementing a diet of polished rice to which vitamin B₁ has been added. It is a growth principle and seems to be a stored vitamin factor. Musser reports that more recent work indicates that vitamin B₃ appears to be a more abundant supply of vitamin B₁ and therefore doubts the existence of vitamin B₃. Another worker has found a "filtrate factor" in vitamin B complex—a dietary essential for the chick—which promotes growth and is probably not identical with the anti-pellagra factor in chicks. This chick anti-pellagra factor has been believed by some to be in vitamin B₃ and vitamin B₅. Further investigations are necessary to establish any relationship of vitamin B₃ to human nutrition.

VITAMIN B₄

Tentative formula—C₄N₄H₅Cl or C₄H₄N₄HCl . ½ H₂O. Barnes in 1932 isolated a heat-labile crystalline preparation of vitamin B₄. The crystals consist essentially of adenine hydrochloride, but probably contain some impurity which causes activation. The vitamin is alkali-labile and is easily destroyed. It is closely as-

sociated with vitamin B₁ and some workers suggest that both vitamin B₁ and vitamin B₄ are necessary for the prevention of beriberi, while vitamin B₂ and vitamin B₄ are necessary for the prevention of pellagra. Reader thinks a third factor is necessary in the treatment of pellagra and proposes two vitamin B₄ factors—vitamin B_{4a} and vitamin B_{4b}. It is not abundant in foods; whole wheat is a source of vitamin B₄ needed by the rat in addition to vitamin B₁ and vitamin B₂.

This intimate association between vitamin B₁ and vitamin B₄ is not yet understood. Vitamin B₄ seems to be a variation of vitamin B₁ since vitamin B₁ cannot be obtained free from vitamin B₄ activity. The apparently pure crystalline preparation of vitamin B₁, as isolated independently in different laboratories, is one of the richest sources of vitamin B₄ activity. The standard procedure for producing avitaminosis B₄ actually consists in first subjecting the experimental animals to vitamin B₁ deficiency. Vitamin B₄ deficiency seems to resemble a state of chronic or persistent deficiency of vitamin B₁, since it can always be cured by the administration of a sufficiently large dose of vitamin B₁. Specimens of supposedly pure crystalline vitamin B₁, prepared in different parts of the world, having identical properties, and giving no evidence of admixture with impurity, when examined by X-ray analysis or other means, all possess their characteristic vitamin B₄ activity.

György (1935) claims that in the absence of the vitamin B₄ fraction there occur lesions of the nervous system with disturbances in coördination and ataxia, hence the name, anti-paralytic vitamin. Elvehjem thinks that it may prove to be important in nutrition in man and in the treatment of certain disorders of the brain. He believes that the encephalomalacia of chicks prevented by the addition of certain vegetable oils to the diet is due to lack of vitamin B₄—and claims that the factor preventing paralysis in chicks is identical with vitamin B₄. Others disagree with this on the basis that vitamin B₄ is water soluble, while soy bean oil, which contains the anti-paralytic factor, is a fat.

VITAMIN B₅

This fraction of vitamin B complex in conjunction with vitamin B₃ has been thought to be the chick anti-pellagra factor. At present our knowledge of vitamin B₅ is quite nebulous.

VITAMIN B₆

The chemical composition and structure is unknown. With lactoflavin it is one of the principle components of vitamin B₂ complex. Termed the rat antidermatitis factor by György (1934), it is identical with the Y factor of Chick. The P. P. factor (pellagra-preventing) is now thought by György to be a third factor in the complex—probably vitamin H.

Vitamin B₆ is in a filtrate which remains after removal of the flavins from vitamin B₂ complex, and is responsible for the cure of the specific "acrodynia-like" dermatitis developed by young rats fed on a vitamin B-free diet supplemented with purified vitamin B₁ and

lactoflavin. Vitamin B₆ is not a true water-soluble vitamin, being only partially soluble in that medium, but it is soluble in ethyl alcohol. It is heat-stable, is inactivated by visible light, is adsorbed on fuller's earth from acid solution, is precipitated by phosphotungstic acid, and migrates toward the cathode on electro dialysis. Autolysis, which yields 80-100% extraction from wheat germ, is the method adopted as the standard procedure for the preparation of active extracts of the vitamin. It is suggested that the vitamin does not contain a primary amino-group, but is of a basic nature and possibly contains a hydroxyl group. Vitamin B₆ has some similarity to choline, though pure choline chloride does not cure rat dermatitis.

This essential factor must be largely combined in some way with the tissue in which it occurs, since the greater part is not easily extracted by ordinary solvents. No knowledge has been obtained concerning the nature of the union between vitamin B₆ and the tissue, but possibly the vitamin is attached to the protein as an active group which is not easily split off. Fat has a sparing action on the vitamin. In rat dermatitis produced by vitamin B₆ deficiency, vitamin B₆ alone does not cure it, but extra fat (linseed oil) with vitamin B₆ will cure it. This curative factor in fats is probably linoleic acid, and closely associated with the so-called vitamin F which is necessary for the normal growth of the young rat. The scaly tail and scurfy appearance of the skin in vitamin F deficiency has often been noted in vitamin B₆ deficiency animals. The relation of vitamin B₆ to man is uncertain, as the "rat pellagra," "chick pellagra," and "human pellagra" are apparently not identical.

Standardization

The unit is the minimum daily dose necessary to cure the rat of this specific "acrodynia-like" dermatitis.

Natural Sources—in order of potency

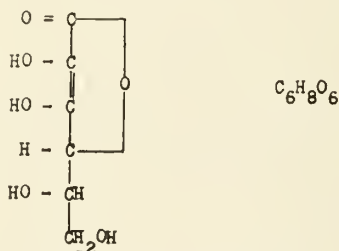
1. Wheat germ exceedingly rich in it—about 5 units per gram.
2. Fresh fish muscle is a rich source (salmon, haddock, herring). Fish muscle contains no vitamin B₂ (lactoflavin).
3. Rice polishings.

VITAMIN C—History

Scurvy has long been known in history. In 1535 Jacques Cartier during a winter on the St. Lawrence reported the cure of a disease, obviously scurvy, by a decoction made from the bark and needles of the spruce tree. A British naval surgeon in 1747 demonstrated the striking effect of fresh lime-juice as an antiscorbutic agent. Lime-juice later became a compulsory supplementary food on all ships in the British navy. Barlow differentiated infantile scurvy from rickets (1883). In 1907 Holst and Fröhlich produced the disease in experimental animals (guinea pigs). The antiscorbutic factor was called vitamin C in 1918 to distinguish it from vitamin B complex, the other water-soluble factor. Isolation in crystalline form as hexuronic acid was made

from bovine adrenal glands in 1928 by Szent-György. This later (1932) proved to be identical with King and Waugh's crystalline active factor derived from lemon-juice. Vitamin C was synthesized by Reichstein in 1932 starting with 1-xylose.

Chemistry



1—ascorbic or cevitamic acid.

Vitamin C is the lactone of threo-3-keto hexonic acid. The properties of the crystalline acid are identical with those of hexuronic acid: solubility in water, insolubility in fat solvents, marked sensitivity to exposure to visible light and to heat and oxygen, especially in alkaline solution. Its melting point is 183° – 185° C, and the optical rotation $(\alpha)_D^{20} = 25^{\circ}$ ($\pm 1^{\circ}$). It has a single broad absorption band at 263 m μ . The essential condition for the antiscorbutic activity in the ascorbic acid group is the d-configuration of the fourth carbon atom.

Vitamin C has a very characteristic power of reduction, by oxidation losing two hydrogens in acid solution, but retaining its vitamin activity. The chemical mechanism of vitamin C activity in the body is not known. Its biological significance is based on the fact that this reaction is reversible. The oxidized vitamin can be reduced with relative ease by the tissues to its original substance, and may thus act as an oxygen carrier. There is more than a probability that vitamin C does not play a specific organic functional rôle in the animal body, but fulfills a general function in the life of protoplasm. In the absence of this vitamin all cellular functions seem to be injured to the same extent. Besides its activity in the respiratory function, vitamin C is fundamentally important in the formation of normal intracellular substance. In avitaminosis C there is a failure to form this substance with normal properties—possibly as a result of reduced cellular oxidation. The mechanism of its activity in the prevention of hemorrhages is uncertain, although it is thought to cause changes in the intracellular substance of the capillaries. However, clinical results with vitamin C therapy have been disappointing in the hemorrhagic diseases, particularly in thrombocytopenic purpura, leukemia, Schönlein's pupura and hemophilia.

Rats, rabbits, calves and birds can synthesize vitamin C in the body, but guinea pigs, swine, dogs, monkeys and man require it in the diet.

Standardization

The International unit, which was formerly defined as the vitamin C activity of 0.1 cc. of lemon-juice, has now been defined as the vitamin C activity of 0.05 mg. of 1-cevitamic (ascorbic) acid. This is the quantity of

1-cevitamic acid usually found in 0.1 cc. of lemon-juice. An ounce of lemon-juice has a potency of 15 mg. of cevitamic acid, while an ounce of orange juice has a value of 20 mg. of the vitamin.

The claim that a food is valuable because of its vitamin C content should be permitted only if it provides a daily intake of at least 250 units of vitamin C. (N. N. R.)

Pathology

The gross and microscopic pathologic changes in infantile scurvy and experimental scurvy in guinea pigs is practically identical. There is a striking inability of the supporting tissue to produce and maintain intercellular substances, hence the effect is on the cells of mesenchymal origin. The intercellular substances concerned are the collagen of all fibrous tissue structures, the matrices of bone, dentin and cartilage, and all non-epithelial cement substance, including that of the vascular endothelium. Bone pathology is explained as due to failure of osteoblasts to form osteoid tissue, and the hemorrhage of scurvy as due to a failure of cement substance in blood vessels.

Soft tissue changes are hemorrhages in regions determined by mechanical stresses and trauma, as well as anasarca and degenerations of skeletal and cardiac muscle. Secondary changes are hypertrophy of the heart, degeneration of muscles, and anemia with bone marrow destruction.

Gross pathologic changes are hemorrhages and bone lesions: sub-periosteal hemorrhages and those in the epidiaphyseal junctions of growing bones, resorption of bone matrix, inactivity of the osteoblasts, osteoporosis, the trümmerfeld zone of disorganization at the epiphysis, and separation and displacement of the epiphysis. In growing teeth formation of dentin ceases, enamel and cementum fail to develop, and the pulp becomes separated from the dentin by liquid produced by the odontoblasts.

Repair following vitamin C therapy is dramatic in character and rapidity—all pathologic lesions soon changing to normal processes and normal tissues.

Chief Symptoms of Avitaminosis C

In Man and Animals (guinea pig):

1. Scurvy—increasing pallor, irritability, spongy and bleeding gums, loosened teeth, sore and swollen joints, petechiae and large superficial hemorrhages, epistaxis, sore mouth, dyspnea, loss of energy, anorexia, loss of weight, anemia, edema, fragility of bones and pseudo-paralysis.

2. Less extreme deficiency.

- a. Hemorrhagic tendencies.
- b. Dental caries, pyorrhea.
- c. Vague aches and pains.
- d. Fatigue, pallor, anemia.
- e. Abnormal cutaneous pigmentation.
- f. Increased susceptibility to infection in general, and to specific cases of diphtheria, poliomyelitis, and tuberculosis.

- g. Joint disease strikingly similar to rheumatic fever.
- h. Vagus nerve disturbance: increased pulse and respiration.
- i. Sensory nerve disorders (paresthesias).
- j. Increased capillary fragility.

Total absence of vitamin C from the dietary is extremely rare in America and frank scurvy is not common in adults, though somewhat more frequent in children. Infantile scurvy occurs mostly between 6 and 18 months of age, and particularly in the winter and spring following a low intake of vitamin C. Subclinical avitaminosis, that is, mild or partial deficiency causing ill-defined symptoms, is rather widely accepted and is probably very common.

Laboratory Diagnosis

1. Blood Plasma Test

Estimation of reduced vitamin C in blood by chemical test. Blood plasma values of less than 0.75 to 0.80 milligram per cent of reduced vitamin C indicate subnormal vitamin C intake. Abt reports (April, 1937) that his findings for normals was above 0.8 milligram per cent, for prescorbutics between 0.8 and 0.6 milligram per cent, and for active scurvy below 0.5 milligram per cent.

2. Urinary Excretion Test

This test is based on determination by chemical titration with 2,6-dichlorophenol—indophenol of the amount of vitamin C normally excreted in the urine; and the response to a large test dose or doses of pure cevitamic acid (saturation or retention test).

An excretion of 20 milligrams per day is the lower limit of normal excretion (Youmans).

3. Capillary Resistance Test.

This method consists essentially in creating a pressure on the arm of the patient and observing, in a small area, the number of petechiae which appear in a certain length of time. This test is not specific for avitaminosis C.

4. X-ray of Long Bones

Clinical Applications of Vitamin C

1. Prevention and cure of scurvy.

2. In dental caries, pyorrhea, certain gum infections (Hanke), anorexia, anemia, and undernutrition—which may be concomitant signs of vitamin C deficiency.

3. Maintenance of strength of capillaries.

4. Parenterally as sodium cevitamate in conditions interfering with oral ingestion of vitamin C or its absorption in optimal amounts (persistent vomiting, diarrhea, etc.).

5. In infant feeding, routinely.

6. In cases of lowered intake of vitamin C due to a restricted diet, either voluntary or imposed (Sippy diet).

7. In certain infections which demand an increased supply of vitamin C—as tuberculosis, rheumatic fever, diphtheria, poliomyelitis, and pneumonia.

8. Prevention of peptic ulcer (Smith and McConkey).

9. Demands of pregnancy.

10. Decrease in certain cutaneous pigmentations.

11. Acceleration of coagulation of blood in hemorrhagic diseases (value controversial).

12. Promotion of union of fractures—in conjunction with vitamins D and B.

Vitamins A and C are anti-infectious only in the limited sense that in their absence pathologic changes occur which may open the way to secondary infection. Rinehart in 1935 produced in guinea pigs typical heart lesions of rheumatic fever—the Aschoff bodies, by infection in addition to a partial vitamin C deficiency.

Daily Requirements

1935 Szent-György	in infants	25 mg.
	in adults	50 mg.
1936 King	in infants	25 mg.
	in adults	to 40 mg.
1937 Youmans	as minimum	25-40 mg.

Natural Sources—in order of potency

Oranges and lemons, particularly.

Excellent sources: grapefruit, tomato juice, limes, tangerines, lettuce, fresh strawberries, raw cabbage, water cress, apples, bananas, paprika, spinach, carrots, fresh pineapple, and grapes.

Good sources: potatoes, peas and string beans, if not cooked too long.

Vitamin C has been called the vitamin of uncooked foods. Nearly all fresh fruits and vegetables have anti-scorbutic value—especially the citrous fruits. These articles must be prepared with care, however, as vitamin C is the most easily destroyed of any of the vitamins. In foods this vitamin deteriorates rapidly on standing. It is completely destroyed by boiling for thirty minutes in the presence of air and moderately alkaline solution, as when the cook adds soda to the water in which vegetables are boiled to preserve their green color. Oranges from trees sprayed with certain chemicals, and tomatoes artificially ripened by ethylene gas contain little of the vitamin. Fruits or vegetables which have been cooked at high temperatures with full exposure to air may have had their vitamin C oxidized. The vitamin is more stable in fruit than in vegetable juices. Certain metal containers also impair its potency, especially copper and tin, while nickel, chromium, aluminum and glass are harmless. Canning of fruits, and vegetables can now be done with little loss of vitamin C by exclusion of air. Breast milk has four times as much vitamin C as milk from cows on a summer diet.

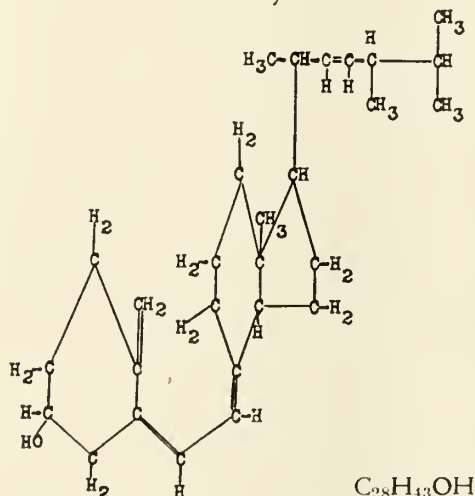
Vitamin C is widely distributed in relatively high concentrations both in plants and in the tissues and secretions of animals. Its content is highest in glandular tissues and lowest in muscle and stored fat. The richest tissue in vitamin C is the pars intermedia of the pituitary gland, the adrenal comes next, and then the liver. It is also found in the corpus luteum, pancreas, brain, lens, aqueous humor, and intestinal wall. Its storage in the adrenal has been a subject of controversy. It is now believed that a liberal amount of vitamin C is necessary for the normal working of this organ rather than that it is stored there for usage of the rest of the tissues, as the liver stores up vitamin A.

VITAMIN D

History

Rickets was first described by Glisson in 1650. Excavation of Viking graves indicate that it existed before that time. Mellanby in 1918 gave substantial evidence that rickets was a deficiency disease, due to the lack of a vitamin contained in cod liver oil, which was either vitamin A or one of similar distribution. Four years later, McCollum demonstrated the separate entity of the antirachitic factor—vitamin D. Huldschinsky, in 1919, found that the short ultraviolet rays of a quartz mercury vapor lamp cured rickets. Hess and Steenbock (1924) made certain foods antirachitic by irradiation, activating their cholesterol fraction, and later they and others proved that this activatable impurity in cholesterol was ergosterol. In 1927, it was believed that vitamin D was irradiated ergosterol, and that ergosterol was the only provitamin D. Recently, other precursors have been recognized, and vitamin D has been found to consist of a number of fractions.

Chemistry



Vitamin D is identical with calciferol, the vitamin active substance produced by the action of ultraviolet light on ergosterol. Calciferol is the most powerful antirachitic agent known and is 400,000 times as effective as cod liver oil in curing rickets in the rat. Calciferol is the most important form of vitamin D from a practical standpoint.

Ten forms of vitamin D have been artificially prepared—all sterols:

1. Cholesterilene sulphonic acid, isolated by Bills in 1925 through treatment of cholesterol with fuller's earth. It is not in fish oils and is only of theoretical importance.

2. Irradiated cholesterol by Bills in 1928.

3. Heated irradiated cholesterol—by Koch and Hathaway (1929).

4. Irradiated ergosterol—whose active principle is calciferol, isolated in crystalline form by Bourdillon and by Windaus in 1932.

5. Non-irradiated ergosterol treated with alkyl ni-

trites by Bills and MacDonald in 1931. It is not in fish oils and is of no practical significance.

6. Irradiated ergosterol treated chemically by Windaus and Langer in 1933. It has an active substance, 22-dehydro-calciferol.

7. Irradiated 7-dehydro-cholesterol synthesized by Windaus and by Bills in 1935, more potent than 22-dehydro-calciferol.

8. Irradiated 7-hydroxy-cholesterol synthesized by MacDonald in 1936.

9. Irradiated provitamin derived from sitosterol, the sterol of the higher plants corresponding to cholesterol of animals,—by Bills in 1937.

10. Ergosterol activated by low velocity electrons has been shown by McQuarrie, *et al.*, to be effective in rickets in human subjects (1937).

Vitamin D has been called the antirachitic vitamin, the sunshine vitamin, or the calcium-phosphate metabolizing vitamin. It is an isomer of ergosterol, the sterol or higher alcohol found in ergot and yeast. The vitamin is fat-soluble, and is very stable to heat and oxygen, although it will be destroyed at temperatures of 180°C. or higher. It is not injured by slightly acid or alkaline media. This vitamin is stored in the body. It is the most important calcifying agent, promoting bony growth by facilitating assimilation of calcium and phosphorus. It is of interest that the vitamin has a phenanthrene nucleus, a structure common to several other physiologically highly active substances such as the sex hormone and the carcinogenic hydrocarbon. Furthermore, ergosterol, calciferol and especially neoergosterol possess estrogenic activity; also some actively estrogenic substances are definitely carcinogenic.

Standardization

The U. S. P. XI unit for vitamin D (equivalent to the International unit) is the vitamin D activity of 1 mg. of the International Standard Solution of irradiated ergosterol (equal to 0.025 gamma of crystalline vitamin D) or the equivalent amount of U. S. P. Standard Reference cod liver oil. The U. S. P. XI requires that 1 gram (15 grains) of cod liver oil shall contain at least 85 U. S. P. units of vitamin D.

The Steenbock unit is that amount of vitamin D which, when uniformly distributed into the Standard vitamin D deficient diet, will produce a narrow and continuous line of calcium deposits on the metaphysis of the distal end of the radii and ulnae of standard rachitic rats. To convert this unit to the International unit, the multiplying factor is 2.7.

The vitamin D content of average cod liver oil is 100 International units or 37 Steenbock units per gram.

Pathology

In rickets, calcium salts are incompletely deposited, or even not at all, both in the maturing proliferative cartilage and in bone which is in process of formation. This failure in lime-salt deposition is the most striking feature in the pathology of rickets and is the essential cause of the gross changes in the skeleton. The only

change outside the skeleton is hypertrophy of the parathyroid glands.

The characteristic bone changes are due to the softening of the bones from loss of inorganic matter and to the subsequent stress on the soft bones, which causes marked deformities. Normally, there is about two-thirds mineral matter in bone, and one-third organic matter. This ratio is reversed in severe rickets. Most of the loss is in calcium phosphate which ordinarily constitutes 85% of the mineral content. Both long bones and flat bones may be affected. Enlargement of the epiphyses of long bones is most noticeable in the regions of most rapid growth, at the wrists, knee and ankle, as well as at the costochondral junctions. The metaphysis is greatly enlarged in width and thickness. Osteoporosis causes curvatures and fractures. Compensory thickening of the cortex is often visible grossly. Large frontal and parietal bosses and areas of rarefaction (craniotabes) are characteristic in the skull.

In the microscopic picture, as in the gross, experimental rickets in the rat resembles human rickets. The pathologic conditions arise from retardation and suppression of the usual sequences in normal ossification. There is failure of provisional calcification of the intercellular matrix, the transitional zone between cartilage and bone becomes irregular and uneven, and the metaphysis presents a disorganized appearance. The uncalcified bone or osteoid tissue is particularly characteristic in rickets. Following vitamin D therapy repair rapidly takes place, the first effects being demonstrable in 24 hours.

The teeth also show pathologic changes, evidenced by dental caries and irregularity in size, shape and position. Marked disturbance of the blood calcium and phosphorus occurs. In infantile rickets, the serum calcium is about normal, 10 to 11 mg. %, but the inorganic phosphorus may be reduced as low as 1.2 mg. % when tetany accompanies the rickets, the serum calcium is diminished to between 5 and 7 mg. %, sometimes as low as 4 mg. %. In active rickets, there is a great increase in the phosphatase activity of the serum.

Chief Symptoms of Avitaminosis D

1. Rickets: irritability, craniotabes, prominent frontal bosses, delayed closing of fontanelles, pigeon breast, rachitic rosary, flaring ribs, epiphyseal enlargement at wrists and elbows, marked perspiration, delayed eruption of teeth, muscular weakness, protruding abdomen and bowing of legs.
2. Spasmophilia or infantile tetany: carpopedal spasm, laryngospasm and convulsions, and spasticity.
3. Osteomalacia: extreme softening of bones, especially in pregnancy.
4. Osteoporosis: failure of normal deposition of calcium phosphate leading to impaired calcification of bone.
5. Cessation of growth.
6. Abnormal ratio of calcium and phosphorus in the blood.
7. Dental malformation and caries.

Laboratory Diagnosis

1. X-ray examination of bones.
2. Determination of calcium and phosphorus in blood serum.
3. Phosphotemic curve of Warkany.
4. Blood phosphatase test for active rickets. Phosphatase of blood increased (Smith, 1933). This method has not been extensively used, but should be made the subject of surveys on a large scale. The test may be indicative of disturbances in calcium and phosphorus metabolism other than rickets.
5. Erb's sign for tetany.

Clinical Applications of Vitamin D

1. Prevention and cure of infantile rickets and tetany.
2. Prevention and cure of osteomalacia.
3. Formation and maintenance of normal tooth structure.
4. In defective calcium and phosphorus metabolism.
5. Routinely during infancy and periods of rapid growth, in pregnancy and lactation.

An adequate intake of calcium and phosphorus is also necessary in all cases.

Daily Requirements

1936	prophylactic and	780-1020 I. U.
Eliot	curative	
1937	for normal infant	not above 300 I.U.
McQuarrie	for premature infant	not above 540 I.U.

From a three-year study of five hundred and sixty-seven full-term infants, Eliot believes that, for prophylaxis and for the prompt control of rickets, the vitamin D equivalent of the usual dose of cod liver oil, namely, two or three teaspoonsful daily, is indicated. Viosterol in milk seems to be the most efficient antirachitic unit for unit. According to her study, viosterol is somewhat more effective than cod liver oil at the same dosage level.

Jeans (1936) states that the amount of vitamin D present from animal source in one standard teaspoonful of average high grade cod liver oil or in milk containing 400 units to a quart is adequate for the infant from the standpoint of calcium retention and growth. The recent report by McQuarrie and his co-workers gives the daily requirement of vitamin D as not above 300 I. U. for normal infants and not above 540 I. U. for premature infants. In view of the fact that one cannot always be certain of an optimal calcium and phosphorus intake nor of the ability of the organism to absorb these elements, he believes that it is probably better to give as an antirachitic between 500 and 1000 I. U. daily.

Vitamin D is required especially during the period of growth, during pregnancy and lactation, as well as in acute and chronic infections, and wasting diseases. There are as yet no controlled clinical reports on the subject.

Natural Sources

1. Fish liver oils: halibut, cod, burbot, percomorph, salmon, haddock, herring, sardine, puffer fish, shark.
2. Egg yolk.

Foods are inadequate sources of vitamin D and cannot furnish the daily requirement. Cereals have a defi-

nite inhibiting effect on the vitamin. Sunshine is not dependable because of the lack of exposure to it, due to clothing, window glass, smoke, dust and fog which destroy the effect of sunshine.

Antirachitics

1. Cod liver oil was the first reliable agent to be established.

2. Direct irradiation of the body by means of ultraviolet energy was next.

3. Irradiated food, particularly milk, was third.

4. Activated ergosterol from yeast.

5. "Yeast milk," produced by feeding cows irradiated yeast, came next.

Since then, other antirachitics have also been used, such as viosterol, haliver oil, percomorph oil, and crystalline vitamin D.

Hypervitaminosis

It is thought that vitamin D is the only vitamin which can cause hypervitaminosis. However, the toxic dose is so large, that this danger is rare. There is little need of anxiety about the administration of viosterol in amounts up to 150,000 International units daily. Except in cases of hyper-sensitivity, one can give fifty to one hundred times the minimum dose with safety. Vitamin D is made more toxic when a large amount of calcium is given with it. Experimentally, an excess of vitamin D produces increased calcification of tissues, particularly of the cardiovascular system. It increases calcium excretion in the urine and causes loss of appetite and of weight, diarrhea, cachexia and a disturbance in fat and calcium metabolism. The cement substance of the teeth becomes overgrown so that the teeth become ankylosed in the jaw bone. There is over-calcification of the growing bones.

VITAMIN E

History

Evans and Bishop in 1922 announced the discovery of a new fat-soluble substance essential in the diet for reproduction, which they designated vitamin E. Evans successfully isolated (1936) from wheat-germ oil a pure crystalline substance possessing vitamin E activity.

Chemistry

Vitamin E is alpha-tocopherol, a higher alcohol containing one or more hydroxyl groups, with a provisional formula of $C_{29}H_{50}O_2$, and a molecular weight of about 440. Reactions with iodine and hydrogen suggest the presence of three reactive double bonds. The active fraction is fat-soluble, extremely stable with regard to high temperatures, ultraviolet ray, atmospheric oxygen, strong alkali, acids, and hydration. It is not inactivated by hydrogenation or saponification process, but is destroyed by bromination, treatment with potassium permanganate, and long exposure to ultraviolet light. It forms biologically active esters with acetic acid and benzoic acid. The activity is correlated with an absorption band at 294 mμ. Nothing definite is known regarding the mechanism through which this vitamin brings about its physiological action. This anti-sterility vitamin is thought to be not only biologically but also chemically a female sex

hormone. It is stored in the body to a considerable extent. Hill and Burdett, noticing that consumption of "royal jelly" will convert the larva of a working-bee into a queen-bee, suggest that this property is due to vitamin E content.

Standardization

No standard unit has been established.

Pathology

The effect of vitamin E deficiency is on the reproductive system. In female animals fed a diet lacking in this vitamin, the fertilized ova are implanted in the uterus apparently in the normal manner. However, the fetuses die in the uterus and are resorbed. In the male animal, there is a gradual degeneration of the germinal epithelium.

Chief Symptoms of Avitaminosis E

A. In Man.

1. Habitual and threatened abortion.
2. Uterine hypoplasia, amenorrhea, sterility.

B. In Animals (rat and chicken).

1. Failure of reproduction.
 - (a) Female—resorption of young during gestation.
 - (b) Male—sterility with irreversible, incurable lesions in the testes which do not respond to a high vitamin E diet.
 - (1) Loss of fertilizing power.
 - (2) Absence of motility of spermatozoa.
 - (3) Loss of sperm.
 - (4) Loss of sex interest.
2. Paresis in young rats from maternal deficiency.
3. Muscular weakness, atrophy of voluntary muscles in young animals.

The vitamin is held so tenaciously by the tissues, the source is so varied, and the supply so abundant that deficiencies are probably rare in man.

Laboratory Diagnosis

No test available for avitaminosis E.

Clinical Applications of Vitamin E

1. Treatment of sterility, habitual, and spontaneous abortion in man. Vogt-Møller successfully treated 17 out of 20 cases of habitual abortion with wheat-germ oil, after noting favorable results in sheep and cows.
2. Possibly in hypoplasia and hypofunction of the gonads.

Daily Requirements

Human requirement unknown.

Animal requirement—0.1 mg. per rat per day as minimal dose (Drummond 1935).

Natural Sources—in order of potency

Wheat-germ oil.
Vegetable oils—cottonseed oil, corn oil, olive oil.
Lettuce.
Whole grain cereals.
Legumes and soy beans.

VITAMIN F

Vitamin F has become of practical importance because of the great amount of propaganda in cosmetic litera-

ture dealing with dermatological conditions. There has been considerable question among investigators as to whether the expression vitamin F should actually be used in this connection.

In 1927, Burr working with Evans on vitamin E found that animals reared on highly purified low-fat diets still failed to attain normal development and nutrition. Subsequent investigations by Burr and Burr revealed that rats on fat deficient diets have early cessation of growth, scaliness of feet and hands, scaliness of the tail so marked that the tip frequently becomes necrotic and falls off, hematuria, and early death. McAmis, Mendel, and Anderson reported somewhat similar findings in animals on a fat-free regimen. Burr and Burr were the first to find that fats of high degree of unsaturation given in relatively small amounts caused complete disappearance of symptoms. Later, they definitely established that esters of linoleic and linolenic acids were essential for the normal nutrition of the rat; hence, the expression, "the essential unsaturated fatty acids." There has been much controversy as to whether this type of deficiency should be considered a type of avitaminosis. Most reports in the literature term this disorder a fat deficiency disease. Evans and his co-workers as well as others have been referring to this essential factor as vitamin F.

The lack of these unsaturated fatty acids has been known to cause disturbances in gestation and lactation. As regards the human subject little is known. Relatively recently at the University of Minnesota, one of the workers in this field maintained himself on a strictly fat-free diet for a period of over six months—resulting in some rather interesting but not entirely conclusive findings (Brown, et al). In infants maintained on a diet otherwise complete but strictly devoid of fat, it has been shown that eczema developed. Several investigators have found that certain infants suffering from outspoken eczema of long duration have been found to be benefited by internal administration of oils rich in unsaturated fatty acids over a variable length of time (Hansen; Cornbleet).

VITAMIN H

György in 1931 found a factor, insoluble in its natural state, which is necessary for neutralizing the toxic action of dried egg white. He called this principle vitamin H, and now identifies it with the P. P. factor which was later extracted from vitamin B₂ complex.

However, the term vitamin H has been ascribed by others to different essential constituents of the diet. The vitamin H of McCay (1934) in the form of raw liver or preserved raw meat cured trout who failed to thrive on diets with all the known vitamins. Recently, Richardson and Hogan discovered a new vitamin (vitamin H) not identical with vitamin B₆, but which also cures rat dermatitis. It is present in wheat-germ oil, yeast or alcoholic extract of corn starch.

VITAMIN K

Chemistry

Formula is unknown.

The antihemorrhagic vitamin (clotting or coagulation factor) is fat-soluble, relatively stable to heat and light, destroyed by alkaline medium, and not readily absorbed by activated magnesium oxide or activated carbon.

Dam, in 1935, noted a hemorrhagic tendency similar to scurvy in chicks, not prevented by cevitamic acid but by this new fraction which he called vitamin K. It is neither vitamin A or vitamin D. Avitaminosis K produces a reduced prothrombin content in the blood of chicks. The administration of vitamin K can restore the clotting time to normal in three days. It is probably synthesized in the lower intestinal tract—since it is found in the feces of chicks not receiving this factor in the diet.

Natural Sources

Pig liver, hemp seed, and alfalfa are the most potent sources.

Green vegetables are a fair source.

Cod liver oil is devoid of vitamin K.

Isolation

Almquist (1936) reports progress in its isolation and a rapid method of obtaining it in highly concentrated form from alfalfa. A sterol-free oil is produced which is adequate as a source of vitamin K at a level as low as 3 mg. of oil per kilogram of diet.

A new accessory factor closely related to but not identical with vitamin K has most recently (1937) been reported by Quick. He believes that this principle extracted from alfalfa can cure the hemorrhagic tendency in rabbits produced by feeding them spoiled sweet clover hay. Some toxic substance appears to destroy prothrombin or to inhibit the mechanism by which the body produces this clotting factor. The significance of vitamin K or of this related factor of Quick in the hemorrhagic tendencies of man has not been established.

VITAMIN P

Szent-György, Rusznyak and Armentano in Germany report a permeability vitamin which they temporarily call vitamin P or citrin.

Chemistry

A diglucoside of a substance of the flavone group.

Formula: $C_{28}H_{38}O_{17}$.

It is hardly soluble in water or alcohol, but dissolves in alkali.

Vitamin P—has been isolated from orange juice, but is not cevitamic acid.

Action

This new principle seems to improve the symptoms of guinea pigs on a scorbutogenic diet, but more studies must be made on the vitamin character of the flavone. If the vitamin character can be proved, it would indicate that the flavones, so important for the cellular metabolism of plants, have also a definite function in the human cell. The effects of the flavone on human capillaries were studied, showing that it cures vascular purpura. It is practically ineffective, however, in the thrombocytopenic forms of purpura. The citrin inhibits the capillary permeability to proteins in many of the cases.

Natural Sources

In fruit juices and vegetables in association with cavitamic acid.

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South Dakota State Medical Association
Medical Association of Montana

The Minnesota Academy of Medicine
The Sioux Valley Medical Association

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MINNEAPOLIS, MINN., DECEMBER, 1937

THE DOCTOR AND THE PRESS

A penetrating and even-keeled editorial "Better speak up soon" appeared in the Cedar Rapids, Iowa, *Gazette*, November 4, 1937:

"While the doctors inveigh against socialized medicine in their own ethical but inarticulate way, the politicians at Washington appear to be listening more and more cordially to widespread popular demands that the social security laws be expanded to make room for health insurance. Some of them say they don't know why this wasn't done in the first place. It seems a virtual certainty that Congress this winter will be asked to consider some form of health insurance which, if not socialized medicine in itself, is surely a step in that direction.

"For that matter, tax-supported medical service already is a part of the More Abundant Life. The federal home loan bank board set aside \$20,000 to help 2,000 employees establish and maintain a clinic this year as an experiment. If the board likes the results, the experiment doubtless will be continued from year to year.

"Yet notwithstanding this unmistakable trend toward state medicine in this country as a bulwark to a system of health insurance, the theoretical arguments against such a setup remain as strong as ever. An article in the current issue of *Nation's Business* cites some things about health insurance that should have wider circulation.

"'With dues paid and a doctor handy,' the article says, 'overdoctoring results. Pretenders and hypochondriacs are bred. Advertising for certain remedies creates

a medicine craze. A few years ago it was revealed in Germany that four times as much money was used for 35,000,000 persons in insurance as for 30,000,000 uninsured. . . . In Germany in 1930 there were 36,000 panel doctors and 32,000 bureaucrats directing the doctors. In 1936 there were 32,000 doctors and 36,000 bureaucrats. . . .

"'England has hundreds of medical 'Approved Societies' with some 5,000 branches. . . . It was assumed that the panel doctors in these societies would detect disease in its early stages and thereby reduce the tremendous financial loss to workers from illness. A survey revealed that, in 1933, the loss through sickness had increased to 121½ days per worker from nine before health insurance. The record in Germany was much worse. In fifty years of the system there the annual loss from sickness increased from 5½ days to 28. In the United States the loss has remained the same, 6½ days, for twenty-five years.'

"Information like this confirms the belief of many thoughtful citizens that socialized medicine would never be all it is cracked up to be. It does not, however, blind those same citizens to the indisputable fact that the present prevailing system of medical service falls considerably short of the ideal. The loss from illness, in time and money alone, is altogether too large, considering that the technical knowledge and skill to prevent it are available.

"Something could be done to organize that knowledge and skill on a more effective basis. Millions of laymen realize something needs to be done, but they don't know what. They are eager to listen to anyone who professes to know what should be done. Just now the socialistic reformers are doing the loudest, if not the most logical talking—and they are making quite an impression.

"If medical men hope to counteract the plausible arguments of these soothsayers, it behooves the medical men to make a noise somewhere besides in their society meetings and their technical journals. Abandonment of some of the traditional aloofness of the profession will be necessary, but that may be the lesser of the evils the profession faces."

Every point which this editorial makes is pertinent to the average doctor in particular as well as to the medical profession in general. Medical men all too often have confined their activities and writings to their own society meetings and medical journals and have failed to take their part in the health education of the public, with the result that persons without medical education have gone a long way toward disseminating propaganda to their liking. For a long time many newspaper editors have recognized the fact that the best health information is in possession of the physicians and closely allied groups. They have been desirous of publishing such information in the columns of their papers and, thus, disseminate reliable health education everywhere.

Unfortunately, all too often they have been discouraged on the ground that medical ethics did not permit the use of such information in the newspapers. Medical ethics attempts to protect the public against the occasional physician whose practice borders on or actually enters the field of quackery and who seeks undue publicity and misinforms the public. However, medical ethics should not be so construed as to interfere in any way with close coöperation between ethical medical men, their societies, and the newspaper men. The matter of medical education is probably best handled through duly elected or appointed committee members of medical societies, who coöperate to the fullest extent with the newspaper men of their communities. Most of those who edit and publish our newspapers desire to print authenticated news and facts, and no ethical members of the medical profession should fail to coöperate with them in every possible way.

J. A. M.

THE MEDICAL PROFESSION AND ITS DISSENTERS

About the time our profession was recovering from the onset of the Federal Security Act and its probable results, and also from the latter broadside from U. S. Senator Lewis of Illinois as to making us all Federalized, *etc.*, another cloud has arisen, this time also in the East, and is spreading throughout the United States, *i. e.*, the so-called Medical Declaration of Independence, subscribed to by what are claimed to be about four hundred

and thirty of the outstanding physicians and surgeons of this land. As the last-named document will probably be fully quoted and commented upon editorially in the November 27th, 1937, issue of the *Journal A. M. A.*, it will not be necessary to repeat here the proposals and principles of that declaration.

This whole affair of medical practice, especially in these past years of financial depression, with apparently no real relief in sight for some several years at least, is one that requires serious consideration. Already, in rebuttal to the Declaration we are receiving protests against it; one of the communications states positively that some of the signers of said document admit that they signed hastily, "by request," and without seeing the threats of political domination and abuse that lie beneath the pleasing surface proposal of governmental support. According to telegrams this week the national Board of Trustees of the A. M. A., in special session, state that they are not in full accord with the newly-formed group of dissenters to the national A. M. A. policy.

We must realize changed conditions, and how they affect us, and the methods adopted by the political party in power the past several years. It might have been that some other political party could have handled the depression better and not have found it necessary to spend billions for relief of the unemployed, for the sustenance and the care of the sick, as well as aiming to devise social security methods that might help the public at large. But we have had those conditions in extreme form and apparently the end is not yet. Take the case of North Dakota and its needs for some several years past, especially the severe and unusual drouths that have afflicted that state. There have been many thousands of *families* made practically homeless due to those drouths, and we have yet to find any political party able to dodge extensive drouths, even by liberal use of pork-barrel funds for irrigation schemes in this part of the country. Through yearly understandings with the Federal and State governments the North Dakota medical profession coöperated, so that by means of a sinking fund the unfortunate families have been afforded what is designated as *emergency* medical, surgical, and obstetrical relief; the doctors, the nurses, and the hospitals have received some moderate financial compensation, which otherwise never would have come to them.

It's too late now to discuss the relative merits of reducing by say at least one-half, the number of entering medical students; too late to have in hand a liberal state or interstate fund for the relief of indigent physicians; nor can any one now utter a very dubious prophecy that North Dakota, especially in the West, will ever come to its own again with liberal crops. The other states are having their problems, too. There should be formed now committees of the conservative and of the liberal physicians and surgeons, for the serious consideration of all of our problems. This does NOT necessarily mean State or Governmental Medicine.

A. W. S.

APPORTIONMENT OF SPECIALISTS

Will supply and demand take care of the matter, or must we eventually have some regulatory arrangement to limit and distribute medical specialists in proportion to other members of the profession and according to the needs of the population in general?

There has been so much sentimental gush about the gradual disappearance of the old-time family physician that even he feels that it has been overdone. At any rate, it is high time for us to consider the problems of the specialist who cannot with good grace decry these panegyrics. He is dependent upon the general practitioner in some measure for referred work. If the ratio of the specialist to the general practitioner continues to increase, it will not be long before the lucrative fees, that have no doubt attracted many, will be reduced to the level of that of the general practitioner. Everyone knows that it is impractical for a specialist to change his field when it is overcrowded, and it is an embarrassing admission of failure to return to general work.

A. E. H.

WILLIAM C. PORTMANN, M.D.

1858-1937

Dr. W. C. Portmann, born in Herpertswey, Switzerland, on June 7, 1858, died of cardiac failure near Jackson, Minnesota, on November 3, 1937. Dr. Portmann came to Jackson to practice in 1886, and was a well-known pioneer physician in Jackson County. Retired from active practice in 1927, Dr. Portmann had served the Village of Jackson as council member, mayor, school board president, and Jackson County as coroner. He was graduated from the Western Reserve University School of Medicine in 1881. Three sons: Dr. Ursus V. Portmann, Cleveland, Ohio; Mr. Milton C. Portmann, Cleveland; and Mr. Arthur B. Portmann, Cincinnati, survive him. Dr. Portmann was buried beside his wife, who died in 1921, in Riverside Cemetery in Jackson.

News Items

Dr. John F. Turner, of Miller, South Dakota, has removed to Canton to establish practice there. He has been health officer for Hand County.

Dr. Adlai Alvin Brink, Baudette, Minnesota, has moved to a new suite in the First National Bank Building of that town.

Dr. Hamlin Mattson, assistant in surgery in the University of Minnesota Medical School, was made a fellow of the American College of Surgeons in October.

Dr. Frederick Henry Dubbe, New Ulm, Minnesota, has been made a fellow of the American College of Surgeons.

Dr. Angus L. Cameron, Minot, North Dakota, spoke on "Cancer" before the Minot Woman's Forum on October 25, 1937.

Dr. Sidney A. Slater, of Worthington, was elected to the presidency of the Minnesota Public Health Association during November.

Dr. Robert Spencer Westaby, Madison, South Dakota, and Dr. John Clinton Smiley, of Deadwood, attended the recent congress of the American College of Surgeons in Chicago, Illinois.

Dr. Paul William Freise, Bismarck, North Dakota, attended the meeting of the Central Association of Obstetricians and Gynecologists at Dallas, Texas, during October.

Dr. E. L. Tuohy, of Duluth, Minnesota, presented a paper, "The Conduct of Medical Staff Conferences," before the annual meeting of the American College of Surgeons at Chicago on October 25, 1937.

Dr. Frank I. Terrill, medical superintendent of the Montana State Tuberculosis Sanatorium at Galen, spoke before the Butte Anti-Tuberculosis Society on November 18, 1937.

Dr. Stephen H. Baxter, Minneapolis, a former president of the Hennepin County Medical Society, was elected president of the Hennepin County Tuberculosis Association on October 28, 1937.

Dr. Robert Bernard Radl, Bismarck, North Dakota, has been granted a certificate in internal medicine by the American Board of Internal Medicine. He has practiced in Bismarck since January 1, 1936.

Dr. Harry G. Irvine, Minneapolis, consultant in venereal diseases to the University of Minnesota, spoke on "Social Hygiene" at Carleton College, Northfield, Minnesota, on October 22, 1937.

Dr. George Warren Setzer, Jr., of Malta, Montana, attended the recent Congress of the American College of Surgeons, of which he is an honorary member, in Chicago, Illinois.

Dr. Russell Henry Brown, health officer for Codington County, South Dakota, spoke on "Syphilis" before the Watertown Business & Professional Women's Club on October 25, 1937.

Dr. William James Gillesby, of Chicago, a graduate of the University of Illinois College of Medicine in 1932, has been named resident surgeon at the Chisholm Hospital, Chisholm, Minnesota.

A 15-bed frame-and-stucco hospital will be erected at Townsend, Montana, by Dr. Raymond G. Bayles and an associate. It will have an operating room and laboratories.

The Upper Mississippi Valley Medical Society, the Stearns-Benton County Medical Society, met in Little Falls, Minnesota, on October 21, 1937. Speakers were Dr. Waldemar T. Wenner and Dr. Francis John Schatz, of St. Cloud; and Dr. Earl F. Jamieson and Dr. Lloyd F. Hawkinson, of Brainerd.

Dr. Herbert Z. Giffin, professor of medicine in the University of Minnesota Graduate School of Medicine, was elected president of the staff of the Mayo Clinic, Rochester, on November 15, 1937.

Codington County in South Dakota will have a full-time physician and a hospital after January 1938, according to assertions made recently by the board of county commissioners.

According to the *Mandan Pioneer*, Dr. Arthur Conwell Fortney and Dr. Verl Gideon Borland of Fargo, North Dakota, will serve on the staff of the North Dakota Agricultural College Students' Health Service.

Dr. Elmer Oscar Steeves, 60, of Rugby, North Dakota, died on November 19, 1937, at his home. He was graduated from the McGill University Faculty of Medicine, Montreal, Canada, in 1901.

The Lyon-Lincoln Counties Medical Society held a dinner meeting in the New Atlantic Hotel at Marshall, Minnesota, on October 19, 1937. Mr. Arthur P. Dunningan, bacteriologist for the Minnesota State Board of Health, Minneapolis, spoke on "Typing Pneumonia."

Dr. George Clarke Foster, a graduate of the Northwestern University Medical School in 1929, has been awarded the certificate of the American Board of Ophthalmology. Dr. Foster is a member of the Fargo Clinic, Fargo, North Dakota.

Dr. and Mrs. Raymond B. Allen, Detroit, Michigan, visited Dr. and Mrs. Angus Laverne Cameron at Minot, North Dakota, recently. Dr. Allen, a former member of the Northwest Clinic in Minot, is now dean of the Wayne University College of Medicine in Detroit.

Dr. James Kerr Anderson, Minneapolis, instructor in surgery in the University of Minnesota Medical School, spoke before the Southwestern Minnesota Medical Association at Worthington on November 16, on "The Injection Treatment of Hemorrhoids."

The treatment of dementia praecox by insulin injections has been inaugurated at the South Dakota State Hospital for the Insane at Yankton, according to Dr. George Sheldon Adams, superintendent. Dr. Frank William Haas is in charge of the treatments; and Dr. Ina Louise Moore-Freshour, senior physician, will also assist when she returns from a six-weeks' course at Rochester, Minnesota.

Dr. Arlie R. Barnes, Rochester, professor of medicine in the University of Minnesota Graduate School of Medicine, spoke before the Southwest Medical Association at Phoenix, Arizona, on November 19, 1937, on the cardiac diseases.

Mr. R. F. Cranston, chairman of the Fergus County Board of Commissioners in Montana, announces that on December 9, 1937, in the Court House at Lewistown, the board will open bids submitted by physicians wishing to act as Fergus County physician for 1938. Duties will comprise treatment of the sick, poor and infirm of the county, and also of the inmates of the county jail. The county physician must also furnish all medicines.

Dr. Alexander James Rudolf, Milwaukee, Wisconsin, who practiced in Waseca, Minnesota, for 10 years preceding the World War, died at Washington, D. C., on October 5, 1937, of a heart attack. He was graduated from Northwestern University Medical School in 1901.

An \$8,000 addition to the former Burns and Christensen Hospital at Two Harbors, Minnesota, has been announced for bidding. Present owners are Dr. Edward P. Christensen of Two Harbors, and Dr. Edward E. Webber, of Duluth.

Dr. Charles Lewis Sherman, of Luverne, Minnesota, was elected president of the Southwestern Minnesota Medical Association at Worthington on November 16, 1937. This association comprises Nobles, Jackson, Rock, Pipestone, Murray, and Cottonwood Counties.

Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota Medical School, Minneapolis, spoke before the Kiwanis Club of Willmar, Minnesota, on November 23, 1937.

Harry Luther Day, Ph.B., M.D., a diplomate of the National Board of Medical Examiners, and a resident of Peterborough, New Hampshire, has been named assistant editor of the publications of the Mayo Clinic in Rochester, Minnesota.

Dr. Olaf Jenson Hagen, Moorhead, Minnesota, chairman of the executive committee of the National Governing Boards of State Universities and Allied Institutions, attended the annual session of that association at Amherst, Massachusetts, on October 13, 14 and 15, 1937.

Dr. Henry Edward Binet, of Grand Rapids, Minnesota, a graduate of the Northwestern University Medical School in 1916, became a fellow of the American College of Surgeons at the recent clinical congress in Chicago.

Dr. Paul A. O'Leary, professor of dermatology in the University of Minnesota Graduate School of Medicine, Rochester, spoke before the Fort Wayne Medical Society in Indiana on November 2, 1937; and before the Wisconsin State Dental Society at Madison on November 4.

Dr. Richard Charles Monahan, of Butte, Montana, spoke on "Diseases of the Lungs" at the Butte High School on November 11, and repeated it on November 18. The talk was sponsored by the Silver Bow County Medical Society and the bureau of safety of the Anaconda Copper Mining Company of Butte.

Dr. Martin L. Mayland, 69, of Faribault, Minnesota, for 44 years a practicing physician and for the past six years coroner of Rice County, died on November 16 at the Worrall Hospital in Rochester. He was graduated from the University of Minnesota Medical School in 1892.

Dr. Clarence Melvin Peterson, 52, Sisseton, South Dakota, died at Webster during October. A graduate of the old Drake University College of Medicine in 1913, Dr. Peterson had practiced at Sisseton for 24 years.

Dr. Paul Ittkin, of Tolley, North Dakota, a graduate of the McGill University Faculty of Medicine, Montreal, in 1933, has agreed to visit Sherwood, North Dakota, each Wednesday until a regular physician can be obtained for that town. Sherwood has not had a resident physician for some time.

Dr. James Donnell Weir, 73, of Brown's Valley, Minnesota, died at New York Mills on October 21, 1937. A graduate of the Trinity University Faculty of Medicine, Toronto, Canada, in 1896, Dr. Weir had retired from practice at Brown's Valley, and was residing with his daughter at the time of his death.

Dr. William Leonard Renick, 68, of Long Beach, California, a graduate of the University of Louisville School of Medicine in 1892, died at Long Beach on October 22, 1937. For some years he lived in Butte, Montana, and was until 1930 a director of the Miners' Savings Bank and Trust Company in Butte.

At the regular monthly meeting of the Miller Vocational Hospital Alumnae Association in Minneapolis on November 2, Miss Katharine E. Dougherty, R.N., in charge of venereal diseases for the Minneapolis Department of Health, spoke on "Syphilis and Its Control." It is announced that Dr. Rudolph C. O. Logefeil, Minneapolis, will speak on "Gastro-Intestinal Diseases" at the next regular meeting on December 7, 1937.

Dr. Eugene Peyton Cockrell, a graduate of the Washington University School of Medicine in 1906, was elected chief-of-staff of the Kalispell General Hospital, Kalispell, Montana, on October 14, 1937. Dr. J. Arthur Lamb was chosen vice-president; and Dr. Morris Wayne Bottorf became secretary-treasurer. The new executive committee has these members: Dr. Albert Brassett, and Dr. Fayette Boyson Ross. Dr. Phoebe A. Bottorf and Dr. Tom Benjamin Moore comprise the committee on medical records.

Dr. Paul P. Ewald, Dr. Vernard R. Hodges, Dr. Nelson Wells Stewart, and Dr. Henry Everett Davidson, all of Lead, South Dakota; and Dr. Francis Stewart Howe, of Deadwood, have been designated as a temporary committee to arrange for the use of the new respirator purchased by people of the Black Hills region of the state. The respirator, expected to be delivered on December 16, will be placed in Lead.

Dr. Oswald S. Wyatt, assistant professor of surgery in the University of Minnesota Medical School, Minneapolis, and Dr. Robert L. Wilder, instructor in pediatrics in the University of Minnesota Graduate School of Medicine at Rochester, spoke before the Camp Release District Medical Society at Dawson, Minnesota, on October 28, 1937.

Dr. Walter A. Fansler, Minneapolis, associate clinical professor of surgery in the University of Minnesota Medical School, spoke before the Lyon-Lincoln County Medical Society at Marshall, Minnesota, on November 16, on "Abscess and Fistula"; and before the Hennepin County Medical Society in Minneapolis on November 3, on "The Choice of Operation for Cancer of the Large Bowel."

Dr. Andrew Ekern, 72, who practiced medicine in Grand Forks and Hatton, North Dakota, from 1887 until 1905, died at San Diego, California, on October 29, 1937. He was graduated from Rush Medical College in Chicago in 1887, and had been imminent commander of the Knights Templar of North Dakota, as well as worshipful master of Acacia Lodge in Grand Forks.

The Minnesota State Medical Association's broadcast for December over Station WCCO (810 kilocycles or 370.2 meters) every Saturday at 9:45 A. M., are as follows: December 4, "Nasal Obstruction"; December 11, "Typhoid Fever"; and December 18, "Tuberculosis." Dr. William A. O'Brien, associate professor of pathology and preventive medicine in the University of Minnesota Medical School, is the speaker.

Dr. John Franklin Walker, 64, of Lemmon, South Dakota, died on October 29, 1937, in an Aberdeen hospital. A graduate of the University of Minnesota Medical School in 1908, Dr. Walker had been health officer for Perkins County, and had served as president of the Lemmon Board of Education. He came to Lemmon in 1928, having previously located at Bison in 1910.

Three sectional postgraduate medical meetings sponsored by the Medical Association of Montana were held during November. The first was held at Billings on November 8 and 9; the second at Anaconda on November 10 and 11; and the third at Havre on November 12 and 13. Speakers were Dr. Henry E. Michelson, professor of dermatology in the University of Minnesota; Dr. M. G. Peterman, professor of pediatrics in Marquette University, Milwaukee; and Dr. M. Edwards Davis, associate professor of obstetrics and gynecology in the University of Chicago Medical School.

Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, and secretary of the Minnesota State Medical Association, was honored at a banquet held for him at the Lowry Hotel in St. Paul on November 11. Speakers included Dr. J. A. Myers, Minneapolis, president of the National Tuberculosis Association, Dr. A. W. Adson, Rochester, president of the Minnesota State Medical Association, Dr. O. J. Hagen, Moorhead, retiring president of the Minnesota Public Health Association, and Dr. C. B. Wright, Minneapolis, a trustee of the American Medical Association.

On September 30, 1937, Dr. J. Arthur Myers, professor of medicine in the University of Minnesota Medical School, spoke before the student body of the Medical College of Virginia at Richmond; on October 13, he participated in a postgraduate course for physicians at Oklahoma City; and on October 22, he discussed "The Treatment of Tuberculosis from the Rehabilitation Point of View" before the New Jersey Tuberculosis League at New Brunswick. On November 3, Dr. Myers spoke before the Johnson County Medical Society at Oakdale, Iowa, and the student body of the University of Iowa College of Medicine at Iowa City; and on November 22, he spoke before the District of Columbia Tuberculosis Association in Washington.

Book Notices

A NORTHWEST DOCTOR'S ODYSSEY

Tramping to Failure: An Autobiography, by THOMAS HALL SHASTID, A.M., M.D., LL.B., Sc.D., F.A.C.S., F.A.C.P.; 1st edition, red cloth, black-stamped and library label on cover, 497 pages plus index, many illustrations; Ann Arbor, Michigan: George Wahr: 1937. Price, \$4.00 (rag paper edition, \$5.00).

Dr. SHASTID's name last appeared in this book section in September 1936, when Dr. CONRAD BEREN's text, *The Eye and Its Diseases*, was reviewed by Professor KENNETH A. PHELPS. Dr. SHASTID had contributed to that excellent volume. *Tramping to Failure* is entirely the work of Dr. SHASTID, who lives in Duluth. It abounds with sharp satire and occasional flashes of untempered sarcasm; but this is equilibrated by its shrewd kindness of tone and its sturdy Midwestern common sense. The author, widely travelled and superbly educated, years ago made pleas for corrections of abuses in medical practice and ethics, abuses which today would not be tolerated by any conscientious practitioner. He was roundly cursed for his pains at the time. *THE JOURNAL-LANCET* recommends this interesting autobiography.

ENGLISH PEDIATRICS

Diseases of Childhood, by ROBERT S. FREW, M.D.; 1st edition, heavy red buckram, gold-stamped, 641 pages plus index, illustrated; London, England: The Macmillan Company: 1936. Price, \$11.00.

Dr. FREW, who is physician to the Hospital for Sick Children in Great Ormond Street, London, has partitioned his work into 3 parts: the 1st dealing with the period from birth to one month; the 2nd concerning one month to six months; and the 3rd part considering the period from six months to one year. Many diseases appear in two or all groups; but the changes in their character (since these diseases definitely vary according to the age-levels) are pointed out. This work is the more valuable because of the space given to diseases of antenatal origin; and because of its treatment of the physiology of the embryo. Dr. FREW gives few references; and he advocates changing the cow's milk formula about 12 times before the infant reaches the 18-pound mark. Yet this is a very valuable work to the student and practitioner; Dr. FREW has an admirable style, smooth and flowing, making the work a pleasure to consult. There is a fine index.

SPECIALIST'S VOLUME

Agnosia, Apraxia, Aphasia: Their Value in Cerebral Localization, by J. M. NIELSEN, B.S., M.D., with the assistance of J. P. FITZ GIBBON, A.B., M.D.; 1st edition, blue cloth, gold-stamped, 201 pages plus bibliography, no index, 29 illustrations; Los Angeles, California: The Los Angeles Neurological Society (Room 1253, 727 West Seventh Street): 1936. Price, \$3.00.

This book has as its basis the clinical study of 240 cases, with 25 necropsies, 13 surgical verifications, and two roentgenological corroborations.

The volume has an excellent historical survey of the field, and good sections on eugnosia, eupraxia, euphrasia; and the agnosias, apraxias, aphasias, etc. There is a sound section on methods of examining the patient. Part III, which contains an alphabetical list of symptoms with synonyms, annotations, etc., is especially valuable.

Dr. NIELSEN is associate clinical professor of medicine (neurology) in the University of Southern California Medical School; Dr. FITZ GIBBON is resident in neurology in the Los Angeles County Hospital. *THE JOURNAL-LANCET* is pleased to commend this work.

SPEECH DISORDERS

The Rehabilitation of Speech, by ROBERT WEST, Ph.D., LOU KENNEDY, Ph.D., and ANNA CARR, M.A.; 1st edition, tan cloth, gold-stamped, 14 plates, 28 figures, 373 pages plus appendices, bibliography & index; New York: Harper & Brothers: 1937. Price, \$4.00.

Psychologists are accomplishing amazing results these days in corrective work for persons afflicted with speech disorders, and it behooves the physician to know what methods and technics are being used. This book offers such explanation, and may be read with much profit by nearly every physician. Dr. WEST is professor of speech pathology in the University of Wisconsin; Dr. KENNEDY is associate professor of speech in Brooklyn College, New York; and Miss CARR is clinical advisor in speech at the Wisconsin State Teachers College in Milwaukee. Though non-medical, this work can be recommended.

AN ELEMENTARY PHYSIOLOGY-ANATOMY TEXT

Physiology & Anatomy, by ESTHER M. GREISHEIMER, B.S. (in education), Ph.D., M.D., third edition, revised, red cloth, gold-stamped, 424 illustrations (48 in color), 637 pages plus glossary and index; Philadelphia: The J. B. Lippincott Company: 1937. Price, \$3.00.

Professor GREISHEIMER has written a text which is not intended for students of medicine. It is rather a book for the use of nursing students, medical technicians, hospital superintendents, etc. It is well-written and organized, and is as complete as one might judge, for the purpose to which it will be put. The illustrations are acceptable, and many of them are in color. Dr. GREISHEIMER formerly was an associate professor of physiology in the University of Minnesota at Minneapolis; she is now professor of physiology in the Woman's Medical College of Philadelphia.

PHYSIOLOGIST'S EXPLANATION

Why We Do It, by EDWARD C. MASON, M.D.; 1st edition, dark brown cloth, stamped in gold, 177 pages, no index, no illustrations; Saint Louis, Missouri: The C. V. Mosby Company: 1937. Price, \$1.50.

For a summary of a subject which is responsible for piles and piles of literature—*Why We Do It* is a good job. The author has applied the first principle of good writing: he has learned the trick of omission. He discusses briefly but succinctly the three fundamental motivations of human behavior, sex, herd and ego interests. He emphasizes the importance of the endocrinal and sympathetic systems in the production of the total personality. The two chapters on sex are sane and useful. The chapter on treatment is a brief review of the technics of psycho-therapy which are in vogue today.

The author is professor of physiology in the University of Oklahoma School of Medicine at Oklahoma City.

NEW EDITION OF MENNINGER

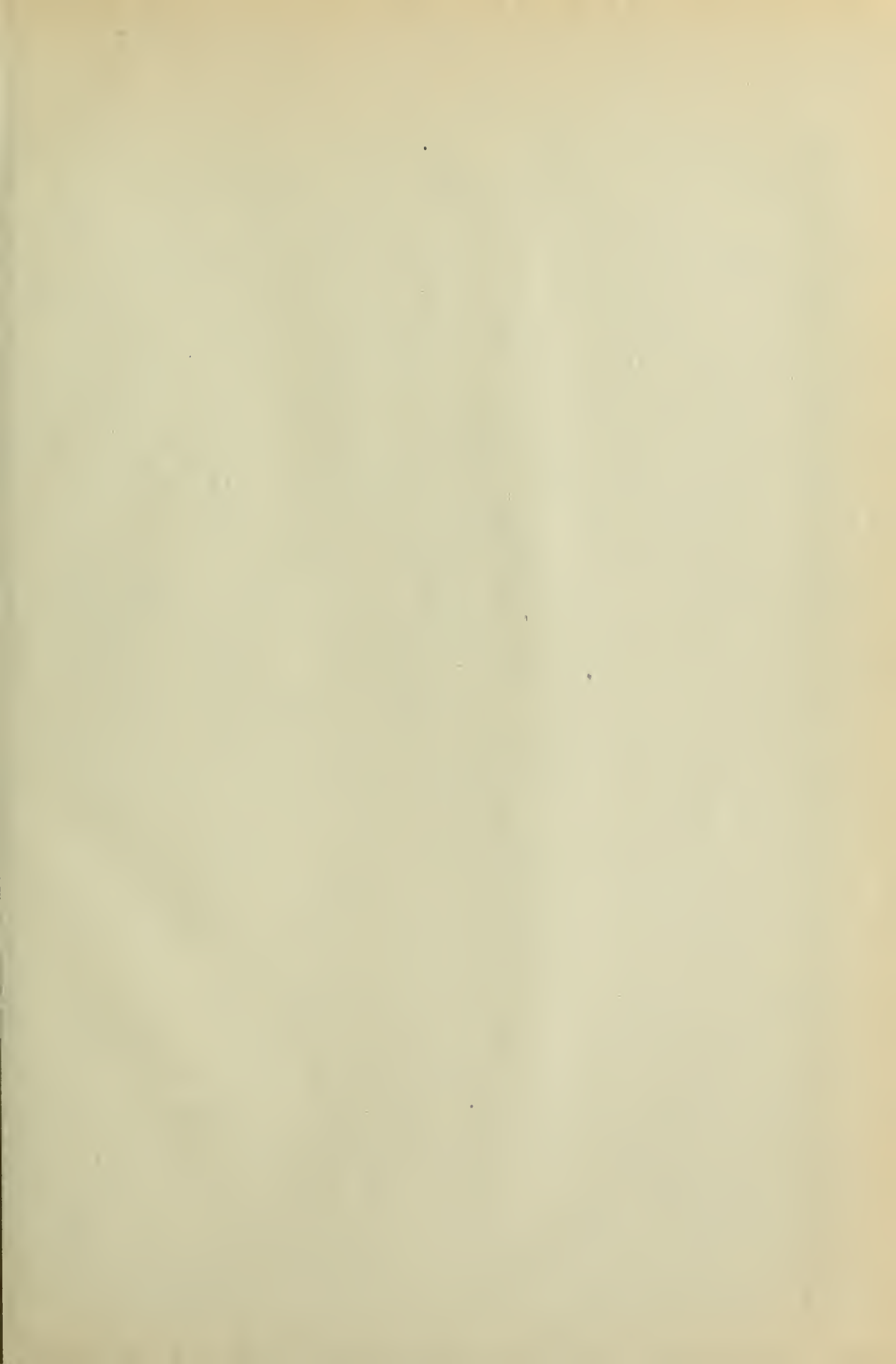
The Human Mind, by KARL A. MENNINGER, M.D.; 2nd edition, revised, heavy cloth, stamped in silver. 520 pages, illustrated; New York: Alfred A. Knopf, Inc.: 1937. Price, \$5.00.

The interesting quality of this famous book, as SMITH ELY JELLIFFE has pointed out, is that it is fully as scientific as if it had been written in the stilted nomenclature of the practicing psychiatrist. This edition represents several changes in MENNINGER's attitude. He introduces a new conception of suicide. He includes many divergent modern views on heredity and environment in relation to personality formation. He does, moreover, present suggestions as to the practical applications of psychiatry in general practice. This is a beautiful book, and is recommended by *THE JOURNAL-LANCET* without qualification. There is an especially good bibliography.

The author is chief-of-staff of the Menninger Clinic in Topeka, Kansas.









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